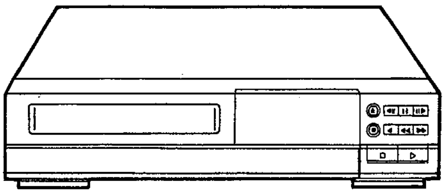
HITACHI

SERVICE MANUAL

TK No.8803E

VT-L2300E

AF MECHANISM



This model uses a AF MECHANISM.
Refer to the following manual for the AF MECHANISM.

Manuals releted to the VT-L2300E

Name of manual	Manual No.
AF Mechanism	4412E
VT-L1100E	8609E

VHS

This video deck is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

September 1998 AV Consumer Products Division, Tokai

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

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The AF mechanism is used as the mechanical block of this VCR. Refer to the following manual when dismantling the mechanical section

◆ AFmechanism edition (No.4412E)
"CHAPTER 1 DISASSEMBLY"

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CHAPTER 3 MECHANICAL ADJUSTMENT

The AF mechanism is used as the mechanical block of this VCR. Refer to the following manual when dismantling the mechanical section

◆ AFmechanism edition (No.4412E)
"CHAPTER 2 MECHANISM ADJUSTMENT"
"CHAPTER 3 MAINTENANCE AND INSPECTION"
◆ VT-L1100E (No.8609E)
"CHAPTER 3 MECHANISM ADJUSTMENT"

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CHAPTER 1 GENERAL INFORMATION

1. SPECIFICATIONS

Video Cassette: VHS type
Recording: Rotary two-head helical scan azimuth recording
Tape Speed: 23.39 mm/sec. (03mode)
Tape Width: 12.7 mm
Operation Temperature: 5℃ to 40℃
Video: PAL colour (system I) & CCIR monochrome signals (625 lines)
Recording Lengths: 3, 12, 24
Video Input: 1 Vp-p 75 ohm unbalanced
Video Output: 1 Vp-p 75 ohm unbalanced
S/N Ratio (Video): More than 42dB (03 mode)
S/N Ratio (Audio): More than 40 dB (03 mode)
Horizontal Resolution: Colour: 240 lines (03 mode)
Monochrome: 350 lines (03 mode)
Audio Input: -8dBm 50 Kohm unbalanced
Audio Output: -9dBm 600 ohm unbalanced
Audio Frequency Range: 100 Hz to 8 kHz (03 mode)
Power: AC 230V, 50Hz
Power Consumption: 23W
Cabinet Size: 435 mm (W) × 94 mm (H) × 366 mm(D)
Weight: Approx. 6.2 kg

* Design and specifications are subject to change without notice.

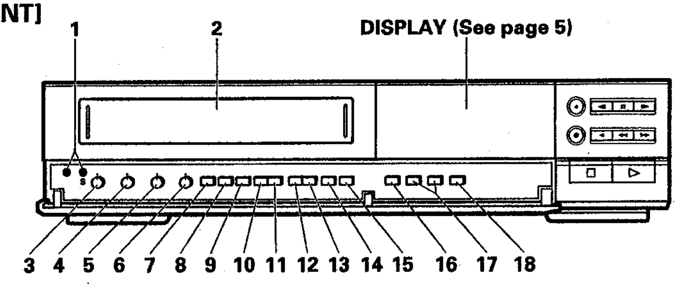
2. COMPARISON OF FEATURES

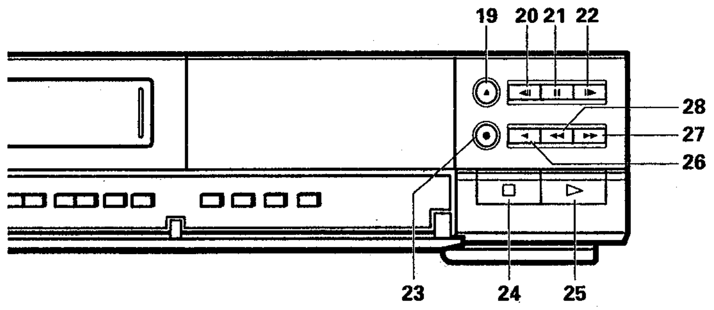
← : Same as left

	ITEM	VT-L2300E	VT-L1100ER
EATUR	Format	VHS	←
	OSD	Yes	←
	Video Rec Mode	03 / 12 / 24 / 48 / 72 / 120 / 168 / 240	03 / 12 / 24
	Video Play Mode	03 / A12 / A24 / 24 / 48 / 72 / 120 / 168 / 240	03 / A12 / A24 / 24
	Audio Rec Mode	03/12/24	←
	Audio Play Mode	03 / A12 / A24	←
	Reverse Play	Yes (1Min)	←
	F.Advance	Yes	←
	Reverse F.Advance	Yes	←
	Fine Still	Yes	←
	Rec Check	Yes	←
	Timer Rec Programm	7 Pro/Week, 2Pro/Day	←
	Alarm Rec Mode	03 / 12 / 24 / 48 / 72 / 120 / 168 / 240	03 / 12 / 24
	Alarm Rec Time	5Sec / 15Sec / 30Sec / 1Min / 3Min / 5Min / 10Min / 30Min / 60Min / TAPE END / Manual	←
	One Shot Rec	Yes	No
	Memory Back Up Time	720 Hr	←
	Tape Speed Display	Yes	←
	Mode Lock	Yes	←
	Version Display	Yes	←
	Buzzer	Yes	No
	Trouble Mode	Yes	←
INPUT/OUTPUT TERMINAL	Video Input/Output	BNC 1 System	←
	Audio Input/Output	US 1 System	←
	Interface(RS-232C) Connector	No	←
	15 Pin Plug 1	Alarm In	←
	2	Alarm Out	←
	3	One Shot In	Alarm Rec Reset
	4	Tape End Out	←
	5	Tape End Reset	←
	6	Warning	NC
	7	NC	←
	8	Time Adj	NC
	9	Camera Sw Out	←
	10	Rec Start In	←
	11	Chroma 25Hz	Gnd
	12	Reverse	NC
	13	(Remote In)	←
	14	Rec Check In	NC
	15	Gnd	←
CHASSIS	Basic	AF Chassis	←
	Video Heads	DA 4 Head SP : 57 / 57 μ m	←
	Auto Heads Cleaning	Yes	←
	Rewind Time	E-180 : 2.5 Min	←

CONTROLS AND FUNCTIONS

[FRONT]

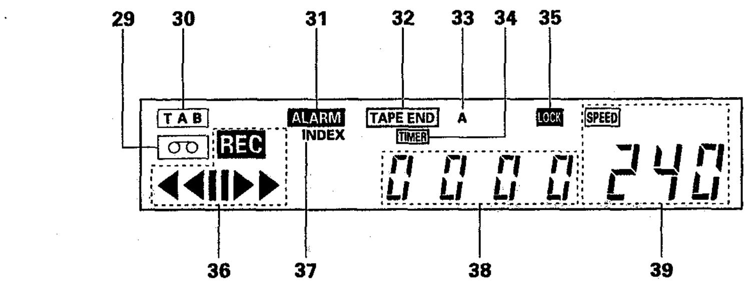




1. **RESET BUTTONS**
   Press these buttons at the same time to clear all (microprocessor) functions.
   Press the "S" button to reset the system. (This does not erase the stored information.)
2. **CASSETTE COMPARTMENT**
3. **SHARPNESS CONTROL**
   Adjust the picture quality to hard or soft during playback.
4. **TRACKING CONTROL**
   Adjust to optimize the picture quality during playback at the 03, A12 and A24 hour speeds.
5. **SLOW TRACKING CONTROL**
   Adjust to optimize the picture quality in the SLOW PLAY mode, e.g. 24 hours speed.
6. **V. LOCK CONTROL**
   Reduces vertical jitter in the still play mode.
7. **PROGRAM BUTTON**
   Press to select one of the six programmable functions.
8. **START/STOP BUTTON**
   Press to start or stop the programming of a programmable function. (Press once to start the programming sequence and a second time to stop (end) it.)
9. **SET BUTTON**
   Press to select the specific value which is to be changed with the UP/DOWN buttons.
10. **DOWN BUTTON**
    Press to decrement, change or reverse to the previous/lower value.
11. **UP BUTTON**
    Press to increase, change or advance to the next higher value.
12. **V-POS (VERTICAL POSITION) BUTTON**
    Press repeatedly to control the vertical position of the programmable display on the monitor.
13. **H-POS (HORIZONTAL POSITION) BUTTON**
    Press repeatedly to control the horizontal position of the programmable display on the monitor.
14. **ALARM INDEX BUTTON**
    Press this button to cause the INDEX indicator to light, and set the VCR to the visual search mode (press F.FWD or REWIND during playback mode) in this state; the start of the alarm recorded can be located.
15. **ALARM RESET BUTTON**
    Press to clear POWER LOSS information. When this button is pressed when the Alarm Memory screen is being displayed, the alarm memory is cleared.
16. **COUNTER RESET BUTTON**
    Press to clear the digital counter to "0000".
17. **REC/PLAY HOURS BUTTONS**
    ▲ (UP): Press to increase hours to the next higher value.
    ▼ (DOWN): Press to decrease hours to the next lower value. The tape speed will be indicated as part of the monitor display.
18. **TIMER BUTTON**
    Press after programming the TIMER for automatic TIMER recording. See page 13 for TIMER programming.
19. **EJECT BUTTON**
    Press to remove the cassette. The EJECT button will not operate in the RECORD mode.
20. **FIELD REVERSE BUTTON**
    Press to reverse the tape by one field in the STILL playback mode.
21. **STILL BUTTON**
    Press to momentarily stop tape motion in the play mode. The STILL function allows close inspection of individual scenes. See the description of STILL playback on page 20.
22. **FIELD ADVANCE BUTTON**
    Press to advance the tape one field in the STILL playback mode.
23. **RECORD BUTTON**
    Press to start recording.
24. **STOP BUTTON**
    Press to stop the tape. The STOP button must be pressed to end the RECORD and PLAY mode.
25. **PLAY BUTTON**
    Press to play recorded material in the forward direction. Pressing this during recording makes it possible to check recordings.
26. **REVERSE PLAY BUTTON**
    Press to play recorded material at the 03, 72, 120, 168 or 240 speed in the reverse direction during the PLAY mode.
27. **FAST FORWARD/VISUAL SEARCH BUTTON**
    Press to activate fast forward.
    Press this button during playback and a forward playback picture at high speed can be seen.
28. **REWIND/VISUAL SEARCH BUTTON**
    Press to start rewind.
    Press this button during playback and a reverse playback picture at high speed can be seen.

CONTROLS AND FUNCTIONS (Continued)

[DISPLAY]



29. TAPE-IN INDICATOR
Lights when a cassette is in the compartment.

30. TAB INDICATOR
Lights when a cassette without its safety tab is loaded.

31. ALARM INDICATOR
ALARM appears during alarm recording.
ALARM flashes when alarm recording ends.

32. TAPE END INDICATOR
Lights when the tape reaches the end during recording.
Note: "TAPE END" is not displayed when you have selected REWIND, RE-REC in the "RECYCLE FUNCTIONS" menu in the alarm display or you have selected REWIND, STOP IF ALARM but an alarm recording has not been made.

33. A INDICATOR
Lights when no video signal is input. Video signal input will turn this indicator off automatically.

34. TIMER INDICATOR
This is lit during timer recording or TIMER stand-by mode.
The indicator flashes in the following cases.
- A cassette is not loaded.
- A cassette without its safety tab is loaded.
- The timer has not been programmed.

35. LOCK INDICATOR
LOCK appears when the recorder is in the security lock mode.

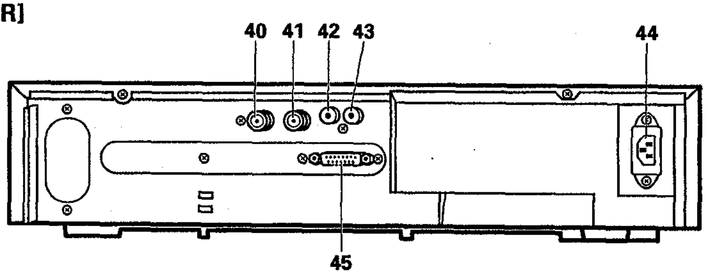
36. VCR MODE INDICATORS
- REC appears during recording.
- ◀◀ appears during the rewind mode.
- ▶▶ appears during the fast forward mode.
- ◀◀ (or ▶▶) flashes during visual search.
- ▶ appears during the playback mode.
- ◀ appears during the reverse play mode.
- ❚❚ appears when the STILL button is pressed during play mode and disappears when the STILL or PLAY button is pressed again.
- ◀❚❚ (or ❚❚▶) appears while the FIELD REV (or FIELD ADV) is held depressed in the still playback mode.
  Note: Still playback is restored when the FIELD REV (or FIELD ADV) button is released.

37. INDEX INDICATOR
INDEX appears when the ALARM INDEX button is pressed.
INDEX disappears when the ALARM INDEX button is pressed again.
INDEX flashes during alarm indexing.

38. DIGITAL COUNTER
Shows the tape counter. The counter does not count during non-recorded sections of a tape.

39. TAPE SPEED INDICATOR
Shows the tape speed.

[REAR]



40. VIDEO IN
Receives video signal from a video camera or another VCR.

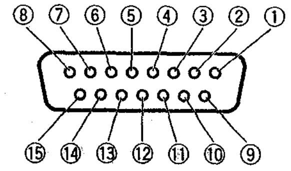
41. VIDEO OUT
For connection to monitor.

42. AUDIO IN
Accepts an audio signal from a camera, external sound equipment or another recorder (Line: –8 dBm, 50 Kohm, unbalanced).

43. AUDIO OUT
Provides an audio output for a monitor or another recorder (–10 dBm, 600 ohm, unbalanced).

44. AC INLET

45. EXTERNAL INTERFACE (15-PIN) JACK
Connect an alarm switch, door sensor, etc. using the 15-pin adapter provided.



① ALARM IN
② ALARM OUT
③ ONE SHOT IN
④ TAPE END OUT
⑤ TAPE END RESET
⑥ WARNING OUT
⑦ NC
⑧ TIME ADJUST
⑨ CAMERA SW OUT
⑩ REC START IN
⑪ CHROMA 25
⑫ REVERSE
⑬ REMOTE IN
⑭ REC CHECK IN
⑮ GND

CHAPTER 2 DISASSEMBLY

1.CASES AND CIRCUIT BOARDS SECTION

1.BEFORE STARTING DISASSEMBLY

[Removal Procedure]
Dismantle each component in numerical order [(A),(B),(C),...].

[Reinstallation Procedure]
Reinstall eachcomponent in the reverse order to removal when otherwise not specified.

Identifications and Locations of Circuit Boards

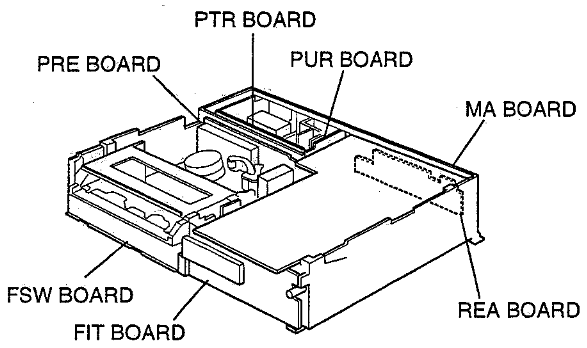


Fig. 1-1 Top View

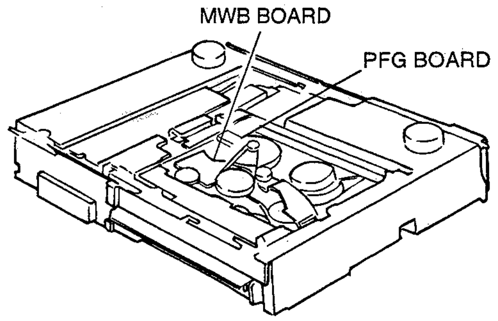


Fig. 1-2 Bottom View

2.DISASSEMBLY PROCEDURE

[How to use the parts hierarchy chart]
1)Locate the part to be replaced.
2)Check the parts in the ranks above the part to be replaced and start dismantling.
3)Replace the difective part and reinstall the parts in the reverse order to that show in the parts hierachry chart.

[Cautions]
1)Dismantle parts in the eject state.
2)Parts can be dismantled in a different way from that shwn here.

Parts Heirarchy Chart

Parts to Removed (First Block)	Item	Parts to Removed (Second Block)	Item	Parts to Removed (Third Block)	Item
Top Cover	2-1	PRE Board PTR Board PUR Board	2-7	AF Mechanism	2-8
Bottom Cover	2-2	MWB Board PFG Board	2-9		
Front Panel	2-3	Cassette Holder	2-9		
		Front Door ☆	2-3		
		Cassette Door	2-4		
		FSW Board	2-5		
		FIT Board			
Rear Panel	2-6	REA Board	2-6	MA Board	2-6
Chassis					

☆:This can be removed if components in the first block are not removed.

Disassembly Procedure Diagram

2-1 Top Cover

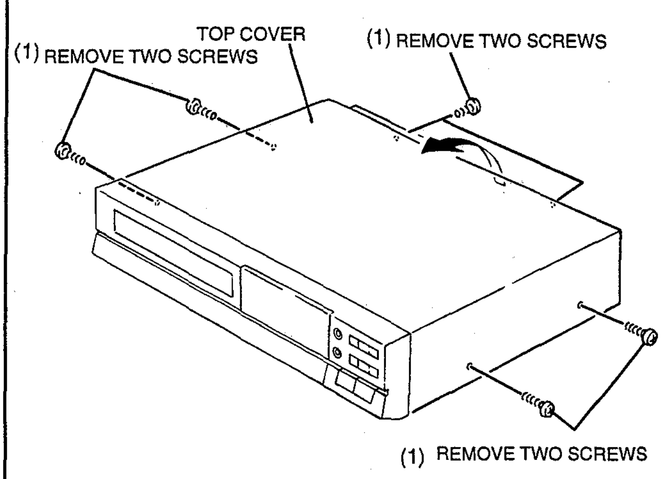

TOP COVER
(1) REMOVE TWO SCREWS
(1) REMOVE TWO SCREWS
(1) REMOVE TWO SCREWS

Fig. 2-1

2-2 Bottom Cover

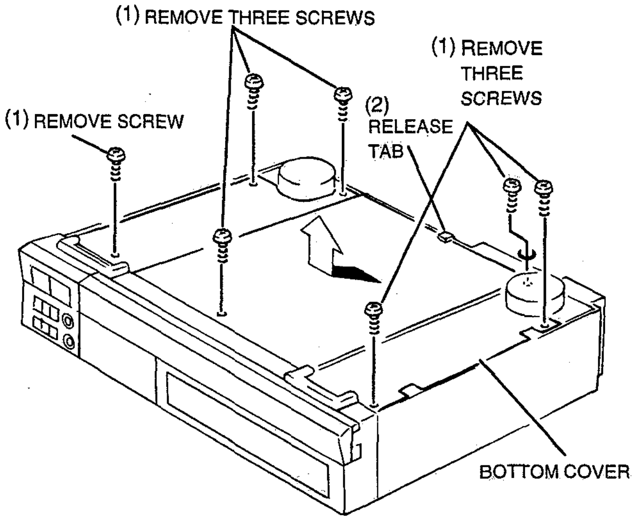

(1) REMOVE THREE SCREWS
(1) REMOVE THREE SCREWS
(1) REMOVE SCREW
(2) RELEASE TAB
BOTTOM COVER

Fig. 2-2

2-3 Front Panel / Front Door

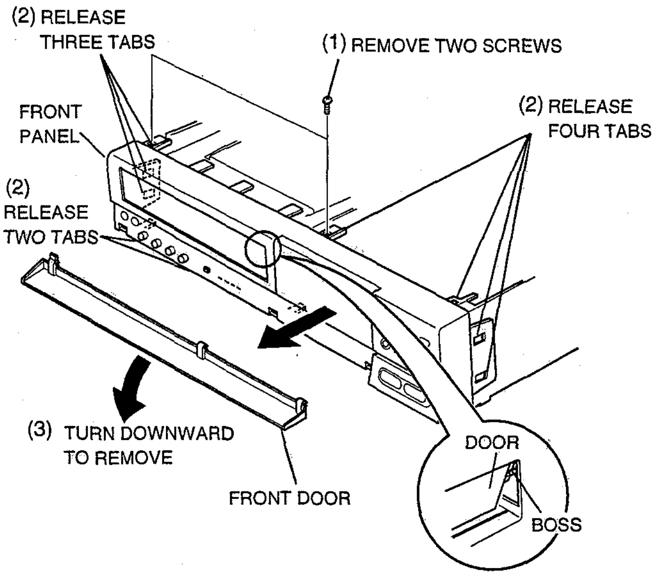

(2) RELEASE THREE TABS
(1) REMOVE TWO SCREWS
(2) RELEASE FOUR TABS
FRONT PANEL
(2) RELEASE TWO TABS
(3) TURN DOWNWARD TO REMOVE
FRONT DOOR
DOOR
BOSS

Fig. 2-3

2-4 Cassette Door

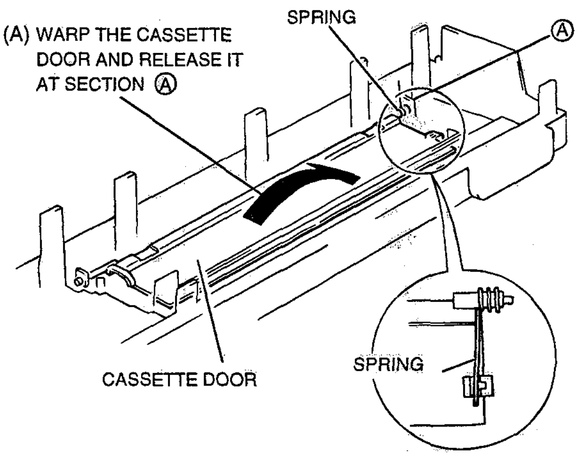

(A) WARP THE CASSETTE DOOR AND RELEASE IT AT SECTION Ⓐ
SPRING
Ⓐ
CASSETTE DOOR
SPRING

Fig. 2-4

2-5	FSW Board / FIT Board

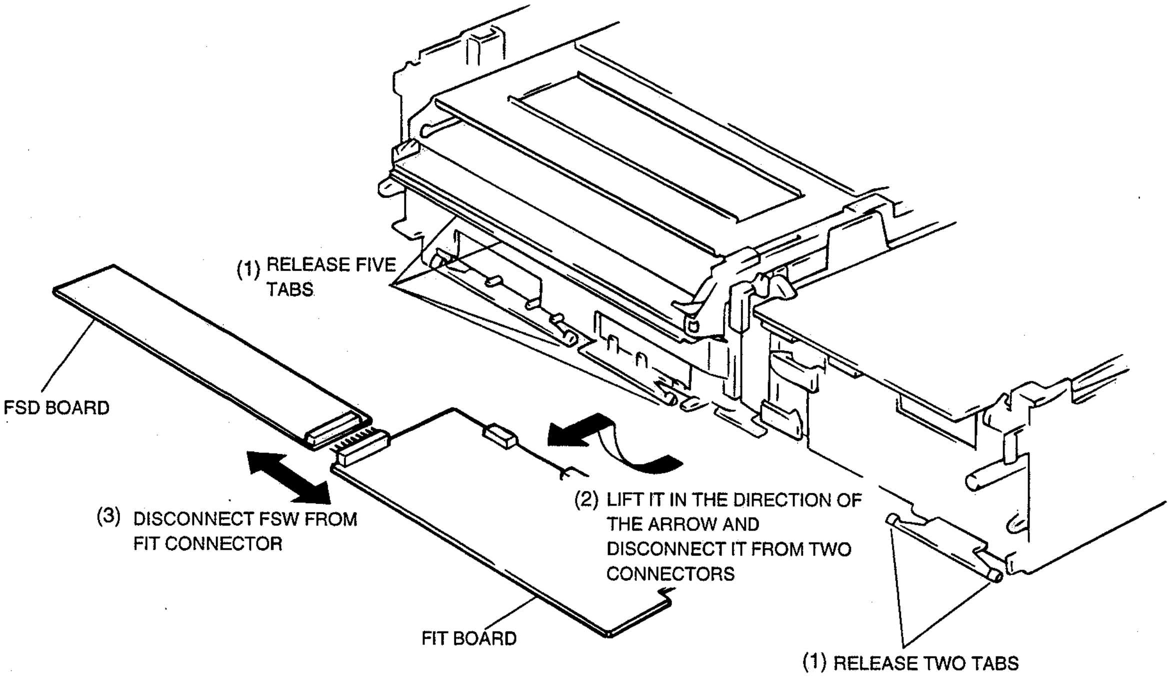

(1) RELEASE FIVE TABS
FSD BOARD
(3) DISCONNECT FSW FROM FIT CONNECTOR
(2) LIFT IT IN THE DIRECTION OF THE ARROW AND DISCONNECT IT FROM TWO CONNECTORS
FIT BOARD
(1) RELEASE TWO TABS

Fig. 2-5

2-6	Rear Panel / MA Board / REA Board

★ 1: This screw have a different shape from other screws.

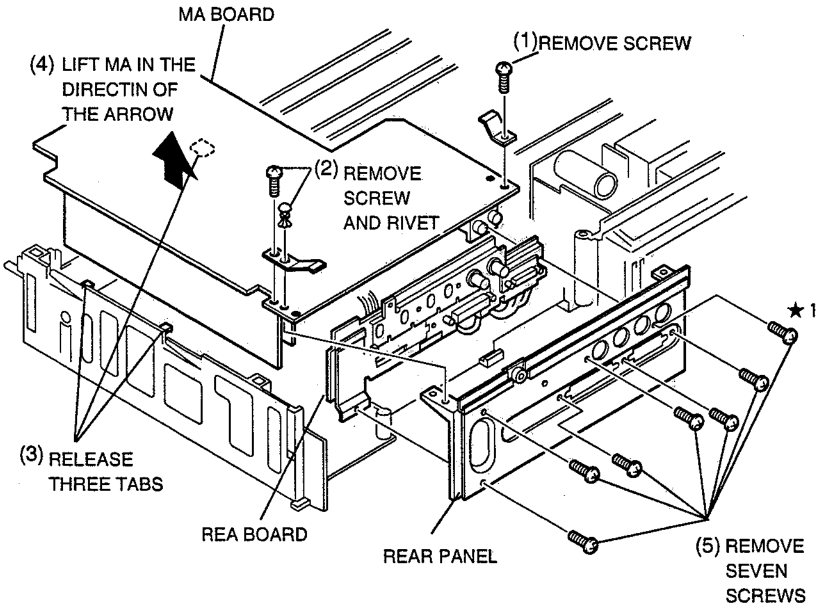

MA BOARD
(4) LIFT MA IN THE DIRECTIN OF THE ARROW
(1)REMOVE SCREW
(2) REMOVE SCREW AND RIVET
★1
(3) RELEASE THREE TABS
REA BOARD
REAR PANEL
(5) REMOVE SEVEN SCREWS

Fig. 2-6

2-7 PRE Board / PTR Board / PUR Board

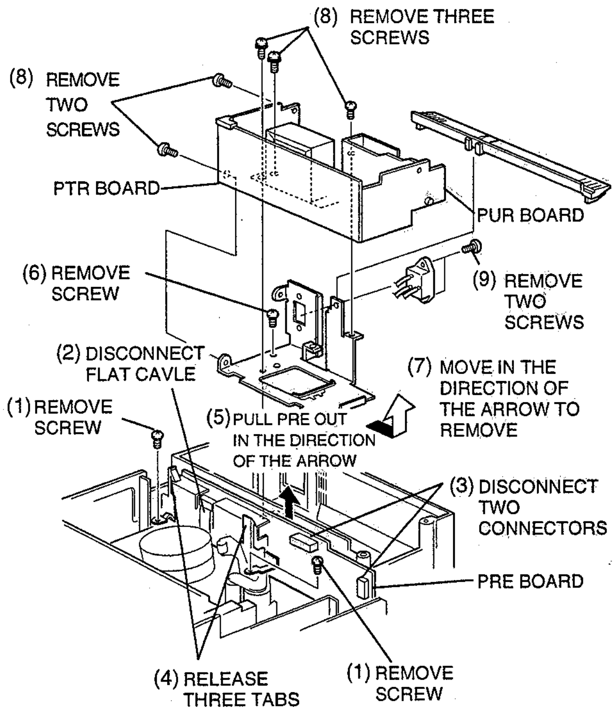

(8) REMOVE THREE SCREWS
(8) REMOVE TWO SCREWS
PTR BOARD
PUR BOARD
(6) REMOVE SCREW
(9) REMOVE TWO SCREWS
(2) DISCONNECT FLAT CAVLE
(7) MOVE IN THE DIRECTION OF THE ARROW TO REMOVE
(1) REMOVE SCREW
(5) PULL PRE OUT IN THE DIRECTION OF THE ARROW
(3) DISCONNECT TWO CONNECTORS
PRE BOARD
(4) RELEASE THREE TABS
(1) REMOVE SCREW

Fig. 2-7

2-8 Cassette Holder / AF Mechanism

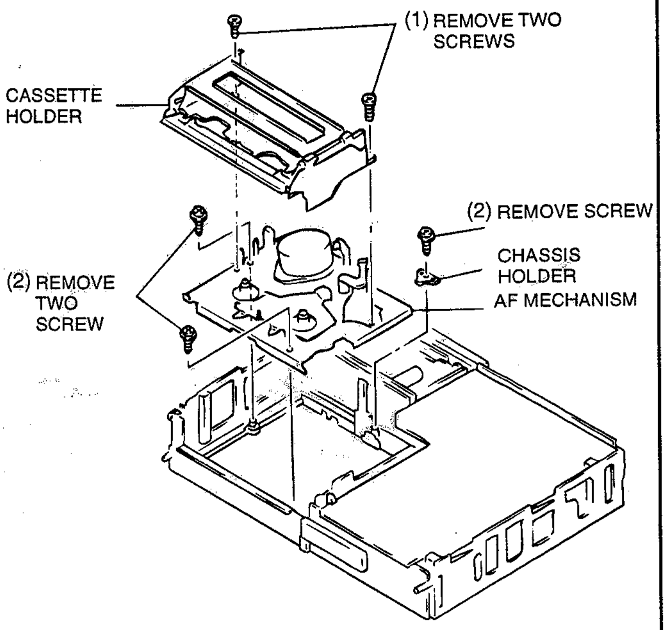

(1) REMOVE TWO SCREWS
CASSETTE HOLDER
(2) REMOVE SCREW
CHASSIS HOLDER
(2) REMOVE TWO SCREW
AF MECHANISM

Fig. 2-8

2-9 MWB Board / PFG Board

★ 1: When reinstalling the mode gear, be sure to match its phase (position).
(See the AF mechanism edition.)

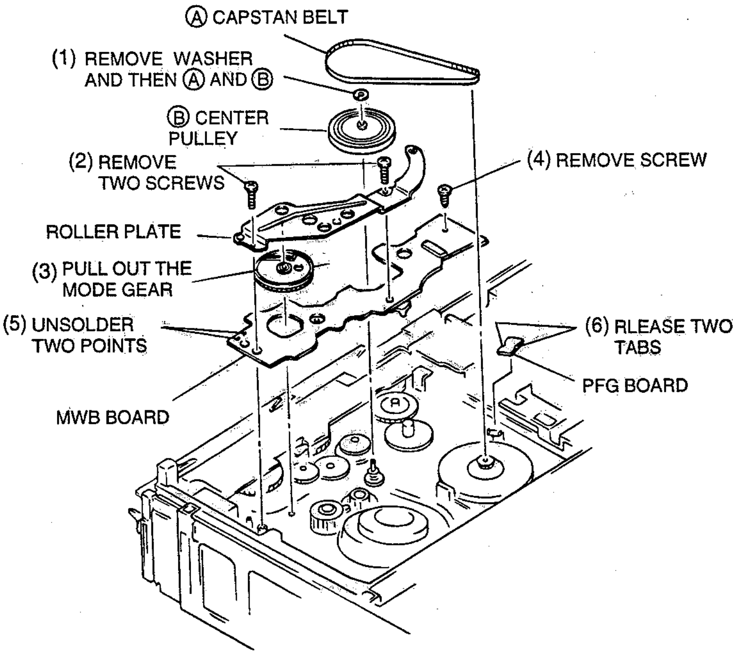

Ⓐ CAPSTAN BELT
(1) REMOVE WASHER AND THEN Ⓐ AND Ⓑ
Ⓑ CENTER PULLEY
(2) REMOVE TWO SCREWS
(4) REMOVE SCREW
ROLLER PLATE
(3) PULL OUT THE MODE GEAR
(5) UNSOLDER TWO POINTS
(6) RLEASE TWO TABS
PFG BOARD
MWB BOARD

Fig. 2-9

2.MECHANISM SECTION

The AF mechanism is used as the mechanical section of this VCR. Refer to the following manual when dismantling the mechanical section.

◆ AF Mechanism edition (No.4412E) "CHAPTER 1 DISASSEMBLY"

1.PHOTOS OF MECHANISM (Refer to these photos when reinstalling)

1) Top view of Mechanism

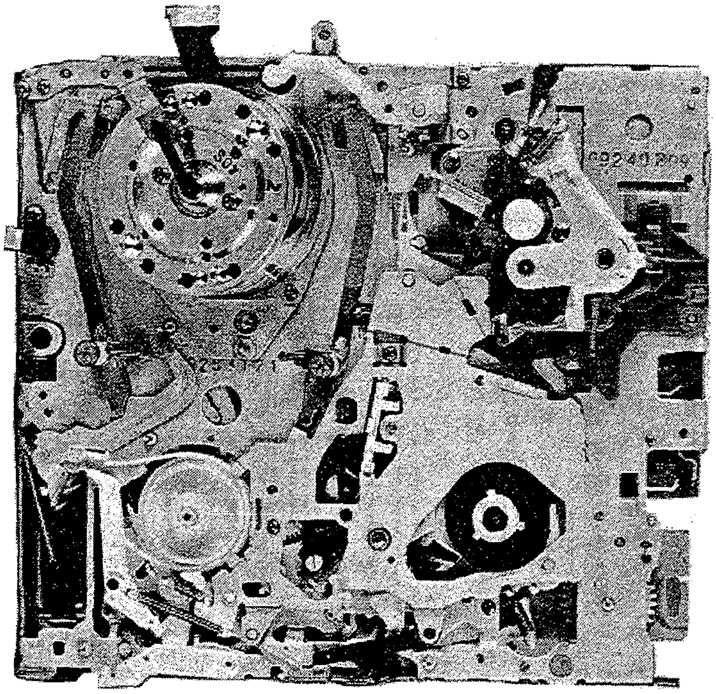


Fig. 2-10

2) Bottom view of Mechanism

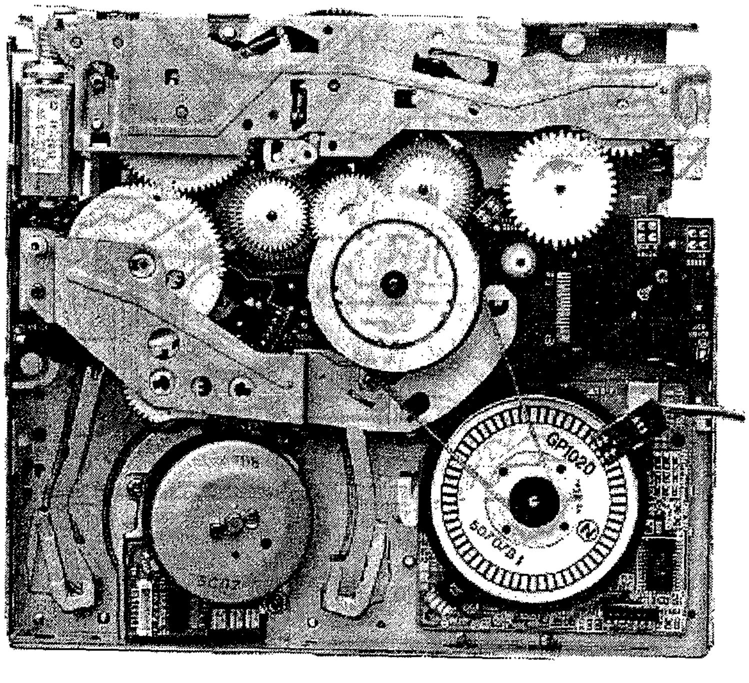


Fig. 2-11

MEMO

CHAPTER 4 ELECTRIC CIRCUIT ADJUSTMENT

1.Circuit Board Locations and Adjustment / Service Position

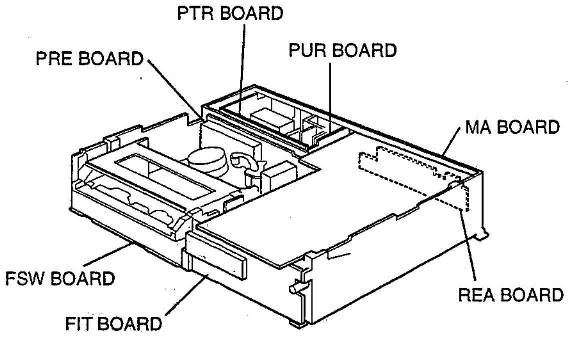


Fig. 4-1

2.Test Equipment and Tapes Necessary for Adjustments

1) Dual-trace oscilloscope
2) Colour bar generator
3) Colour monitor TV (with A/V jacks)
4) Digital voltmeter (DVM)
5) VTVM
6) Alignment tape (30HMPE-3)
7) Blank tape

3.Before Starting Adjustment

1)The following conditions apply when otherwise not specified.
- Oscilloscope probe → 10:1
- Oscilloscope synchronisation → Internal sync
- Ground of test equipment → TP1605, TP3002 (MA board)

2)When performing more than one adjustment, follow the order of times shown here.

4.Preset Position of Switches and Controls During Adjustment

1)Positions of controls

· SHARPNESS CONTROL	: Optimum position
· TRACKING	: Center
· SLOW TRACKING	: Center
· V.LOCK	: Optimum position

2)OSD Setting [SELECTION MENU]

· VIDEO MODE	: AUTO
· SEARCH SPEED	: × 5
· CAMMERA SW	: 12 ~

※:The OSD positions are set at the factory above.

5.Procedure to Reset (Initialize) the VCR

This VCR can be reset to the state set at the factory by the following procedure.

Table. 4-1

	IC	Procedure	Object to be reset
1	System control	Press S1303	System control
	μ P(IC1901)	Press S1303 and S1311 simultaneously	· Timer · OSD settings · System control
2	EEP ROM (IC1903)	Press REV.PLAY SET and ALARM RESET simultaneously	· Trouble memory · Cylinder use time (◆) · Total use time

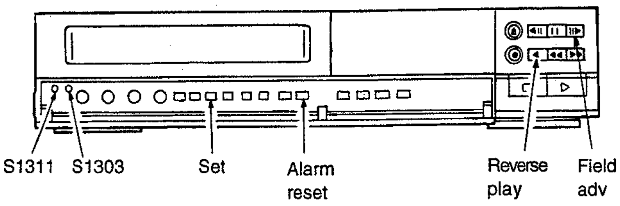


Fig. 4-2

◆:Cylinder time of use

This VCR has function which displays the accumulated time of cylinder rotation as a reference for cylinder replacement. Be careful as all data including the accumulated time is cleared when the EEP ROM is initialized.

The following shows the display of the cylinder time of use and how to reset it without resetting other values.

● Display method (the total use time is also displayed) Press F.ADV and SET simultaously (displayed in the OSD).

●Resetting the time of use only Short TP1604 to ground.

6.Connecting Test Equipment

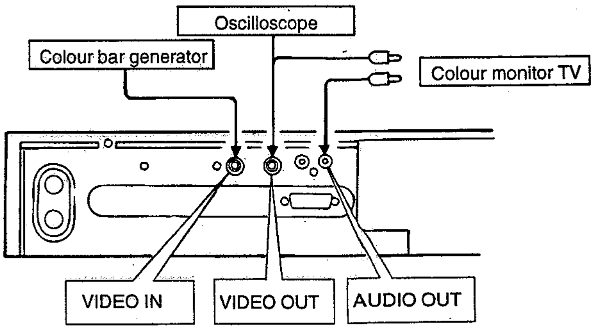


Fig. 4-3

7.Location of Components on Circuit Boards

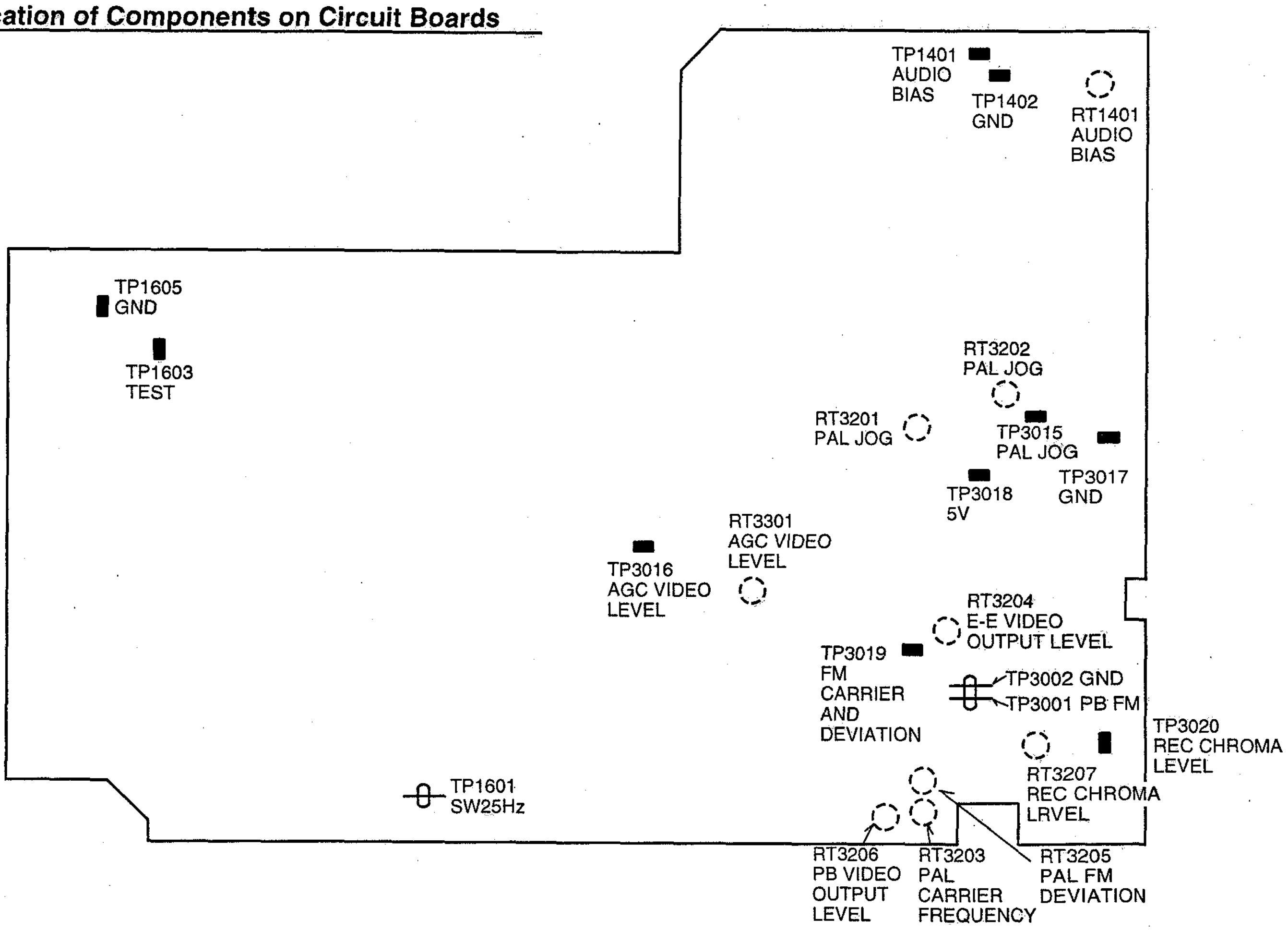

TP1401
AUDIO
BIAS
TP1402
GND
RT1401
AUDIO
BIAS
TP1605
GND
TP1603
TEST
RT3202
PAL JOG
RT3201
PAL JOG
TP3015
PAL JOG
TP3017
GND
TP3018
5V
RT3301
AGC VIDEO
LEVEL
TP3016
AGC VIDEO
LEVEL
RT3204
E-E VIDEO
OUTPUT LEVEL
TP3019
FM
CARRIER
AND
DEVIATION
TP3002 GND
TP3001 PB FM
TP3020
REC CHROMA
LEVEL
RT3207
REC CHROMA
LRVEL
TP1601
SW25Hz
RT3206
PB VIDEO
OUTPUT
LEVEL
RT3203
PAL
CARRIER
FREQUENCY
RT3205
PAL FM
DEVIATION

Fig. 4-4 Main (MA) Circuit Board [Side B]

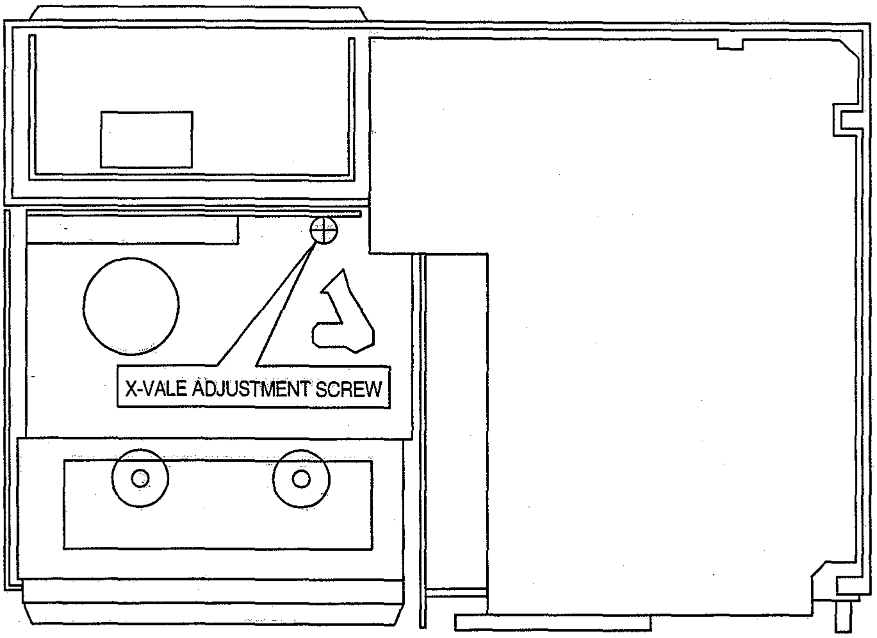

X-VALE ADJUSTMENT SCREW

Fig. 4-5 Top View of Unit

8.Adjustment Procedure

8-1. Servo Circuit Adjustments

(1) Head switching point adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

To set the video head switching point during play to approximately the centre where the CH-1 and CH-2 envelopes overlap each other.

Fault:

The vertical sync signal is degraded and vertical jitter occur.

Switching noise appears across the bottom of the screen.

Test Equipment / Jigs and Connection Points

Oscilloscope: CH-1: Video Out
CH-2: TP1601 [MA board]

State of VCR

1) Play alignment tape (03 mode)
2) During playback, short TP1603 and TP1605 (GND), and then release the short-circuit.
3) Tracking volume: Centre

Adjustment Point

SLOW TRACKING VOLUME (RT1302) [FSW board]

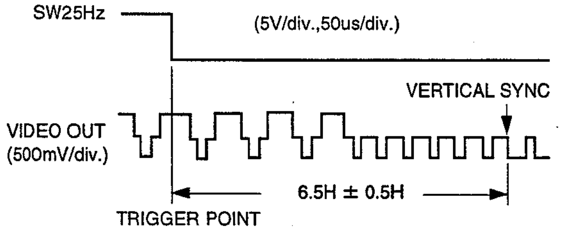
Adjustment Procedure

1) Vertical sync signal: Set to 6.5 ±0.5H from the trailing edge (trigger position) of the SW25Hz pulse.
2) After adjustment, press the STOP button.

<Conditions of oscilloscope>

Trigger with CH-2.
Set the sync slope to "-".

Waveforms



(2) X-Value adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

To obtain compatibility with other VCRs.

Fault:

Noise occurs when tape recorded by onother VCR played back.

Test Equipment / Jigs and Connection Points

Oscilloscope: CH-1: TP3001 [MA board]
CH-2: TP1601 [MA board]

Alignment tape

State of VCR

1) Play alignment tape (03 mode)
2) Tracking volume: Centre

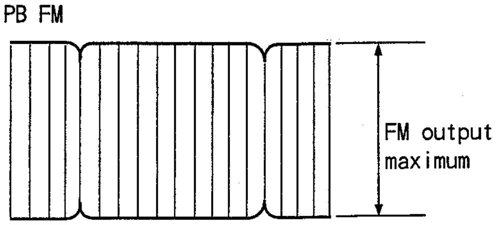
Adjustment Point

X-value adjustment screw

Adjustment Procedure

1) Turn the X-value adjustment screw to maximize the FM output.

Waveforms



(50mV/div., 20us/div.)

8-2. Video Circuit Adjustment

(1) AGC video output level adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

To set the video output level in the E-E mode to a specified value.

Fault:

The correct tint and brightness cannot be obtained.

Test Equipment / Jigs and Connection Points

Colour bar generator:	VIDEO IN
Oscilloscope:	TP3016

State of VCR

1) Receive colour bar signal.
2) E-E mode

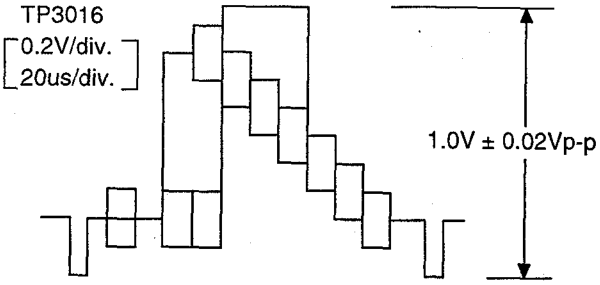
Adjustment Point

RT3301 [MA board]

Adjustment Procedure

1) Adjust RT3301 so the AGC video output level is 1.0 ± 0.02Vp-p.

Waveforms



(2) E-E video output level adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

To set the video output level in the E-E mode to a specified value.

Fault:

The correct tint and brightness cannot be obtained.

Test Equipment / Jigs and Connection Points

Colour bar generator:	VIDEO IN
Oscilloscope:	VIDEO OUT (75 ohms terminated)

State of VCR

1) Receive colour bar signal.
2) E-E mode

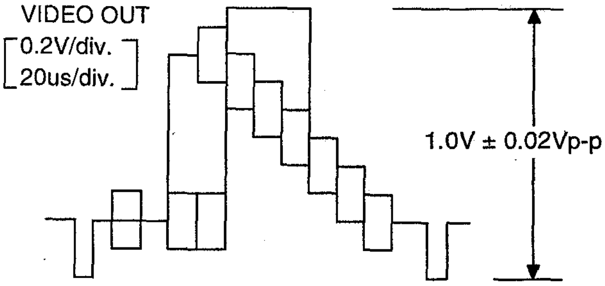
Adjustment Point

RT3204 [MA board]

Adjustment Procedure

1) Adjust RT3204 so the E-E video output level is 1.0 ± 0.02Vp-p.

Waveforms



(3) FM Carrier and Deviation adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

Sets the FM carrier frequency and deviation to the specified values.

Fault:

The picture is distorted when tapes recorded by other VCRs are played by this VCR and compatibility is not obtained.

Test Equipment / Jigs and Connection Points

Colour bar generator:	VIDEO IN
Oscilloscope:	TP3019
Blank tape	

State of VCR

1) Receive a white (100%) signal (line input)
2) REC mode

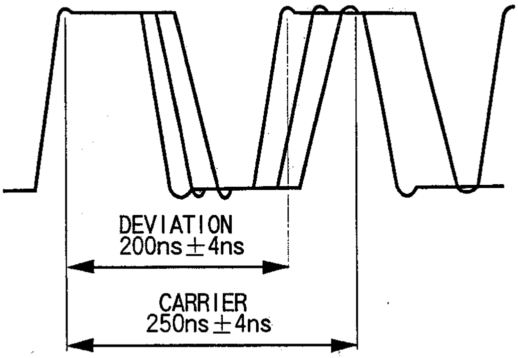
Adjustment Point

RT3203 (Carrier) [MA board]
RT3205 (Deviation) [MA board]

Adjustment Procedure

1) Connect an oscilloscope to TP3019.
2) Set the scope to (+) and adjust the RT3203 so the period of the widest pulse is 250ns±4ns.
3) Set the scope to (+) and adjust the RT3205 so the period of the narrowest pulse is 200ns±4ns.

Waveforms



(4) Rec chroma level adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

Set the record chroma levels to the optimum value.

Fault:

Diamond beats occur in the played back picture or colouring becomes poor.
The played back picture becomes dark and noise increases, or the picture glares and becomes whitish.

Test Equipment / Jigs and Connection Points

Colour bar generator:	VIDEO IN
Oscilloscope:	TP3020
Blank tape	

State of VCR

1) 03-mode record colour bar signal.

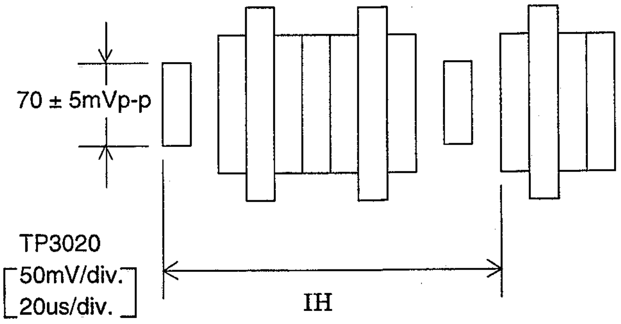
Adjustment Point

RT3207 [MA board]

Adjustment Procedure

1) Adjust RT3207 so the buast level is 70 ± 5mVp-p.

Waveforms



(5) Playback video out level adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

Set the video output level in the VHS mode to a specified value.

Fault:

The correct tint and brightness cannot be obtained.

Test Equipment / Jigs and Connection Points

Colour bar generator: VIDEO IN
Oscilloscope: VIDEO OUT
(75 ohms terminated)
Blank tape

State of VCR

1) 03-mode record colour bar signal and play it back with this unit.

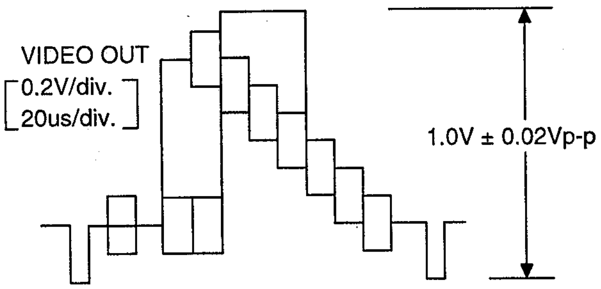
Adjustment Point

RT3206 [MA board]

Adjustment Procedure

1) Adjust RT3206 so the VHS playback level is 1.0 ± 0.02Vp-p.

Waveforms



(6) PAL Jog adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

To set the video output signal to the specified phase position.

Fault:

Colour becomes defective.

Test Equipment / Jigs and Connection Points

Vectorscope: VIDEO OUT
TP3015 [MA board]
TP3017 [MA board]
TP3018 [MA board]

State of VCR

1) Play alignment tape. (03mode / 1kHz section)

Adjustment Point

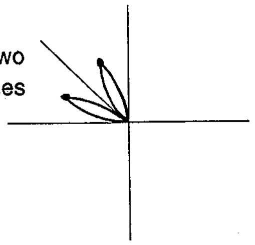
RT3201 [MA board]
RT3202 [MA board]

Adjustment Procedure

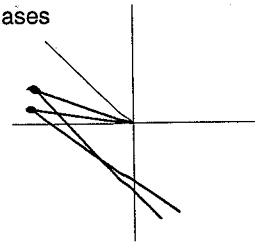
1) Connect a vectorscope to video out. (Set the vectorscope to the + V mode.)
2) Align the two burstphases
3) Short-circuit TP3015 and TP3018 (5V).
4) Adjust RT3201 to align the phases of the two vectors in the YL section.
5) Release the short-circuit.
6) Short-circuit TP3015 and TP3017 (GND).
7) Adjust RT3202 to align the phases of the two vectors in the yl section.
8) Release the short-circuit.
9) Repeat steps 3), 4) and 6),7).

Waveforms

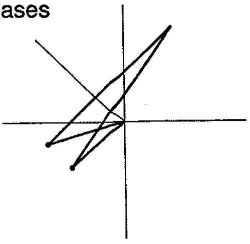
[Step 2]
Align the two
burst phases



[Steps 4]
Align the phases
of the two
YL sections



[Steps 7]
Align the phases
of the two
yl sections



8-3. Audio Circuit Adjustment

(1) Audio bias level adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

To set the recording bias level to the optimum value.

Fault:

High-frequency response deteriorates.
Sound tends to be distorted.

Test Equipment / Jigs and Connection Points

VTVM: TP1401 [MA board]
TP1402 [MA board]

Blank tape

State of VCR

1) No-signal record mode. (03 mode)

Adjustment Point

RT1401 [MA board]

Adjustment Procedure

1) Adjust RT1401 so the VTVM reads 2.7 ± 0.1mV.

(2) Audio playback level check

Purpose of fault occurring if incomplete

Purpose:

To set the audio playback level to the specified value.

Fault:

The correct volume cannot be obtained.

Test Equipment / Jigs and Connection Points

VTVM: AUDIO OUT

Alignment tape

State of VCR

1) Play alignment tape. (03 mode / 1kHz section)

Check Procedure

1) The VTVM reads -5.0 ± 0.5dBs.

9.Trouble Mode Function

This VCR has a function which displays mechanism malfunctions, etc. When the system control μ P (IC1901) detects information on a defect in the mechanism control system. The trouble memory data written to the EEP ROM can also be displayed on the OSD screen.

9-1. Trouble Mode Display

Table. 4-2 Details of Error

	Name of error	Major cause
1	Cylinder Lock	DFG is not normal.
2	Mecha.Lock 1	CFG is not detected for more than 400ms during unloading.
3	Mecha.Lock 2 ~ 10	The object position cannot be detected within the specified time during operation.
4	Reel.Lock 1	The specified CFG is not input when reel lock has occurred.
5	Reel.Lock 2	The specified CFG is input when reel lock has occurred

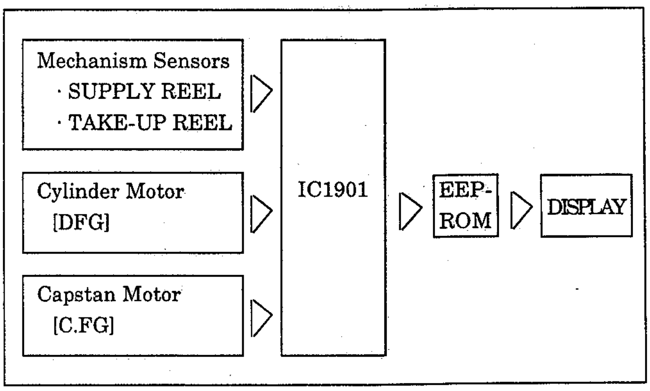


Fig. 4-8 Malfunction Detection

9-2. Trouble Memory Data Display

(1)Display method

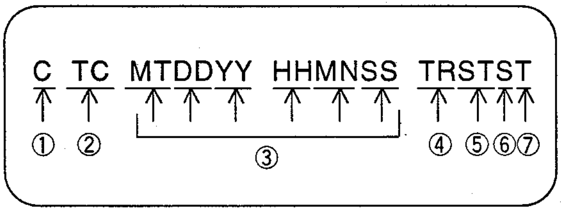


Fig. 4-9 OSD Screen

- Procedure to display the trouble memory
  Press **STOP** , **DOWN** and **H.POS** simultaneously.
- Procedure to erase the trouble memory
  Refer to "5.PROCEDURE TO RESET THE VCR" in this chapter.

(2)Datails of display (See Fig.4-9)

1. C: Number of times

Table. 4-3

Display	Details
1	First malfunction
0	Second malfunction

CAUTION: When malfunctions occurr 9 times or more, the first and the last 8th malfunctions are displayed.

2. T C: Total number of times

3.Data when malfunction occurred

→ M T: Month
→ D D: Day
→ Y Y: Year
→ H H: Hour
→ M N: Minute
→ S S: Second

4. T R: Trouble data

Table. 4-4

Display	Details	Mecha.Position
C Y	CYLINDER LOCK	
M 0	MECHA.LOCK 1	
M 1	MECHA.LOCK 2	FL
M 2	MECHA.LOCK 3	Unload
M 3	MECHA.LOCK 4	Stop
M 4	MECHA.LOCK 5	FF/REW
M 5	MECHA.LOCK 6	Rec/Play
M 6	MECHA.LOCK 7	Slow
M 7	MECHA.LOCK 8	Reverse slow
M 8	MECHA.LOCK 9	Reverse
M 9	MECHA.LOCK 10	Transient
R 1	REEL LOCK 1	
R 2	REEL LOCK 2	

5. S T: Status

Table. 4-5

Display	Details
S T	Normal stop
F 1	FF(when calculating tape remaining)
F 2	FF(when executing soft landing)
F 3	FF(high-speed state)
R 1	REW(when calculating tape remaining)
R 2	REW(when executing soft landing)
R 3	REW(high-speed state)
R S	Rec Pause
R D	Rec
P S	Still
P L	Play
R P	Reverse play
F A	Field Advance
F R	Field reverse
C U	CUE
R V	Review

6. S: Tape speed

Table. 4-6

Display	Details
0	03
1	12
2	A24
3	24
4	48
5	72
6	120
7	168
8	240
E	00

7. T: Tape position

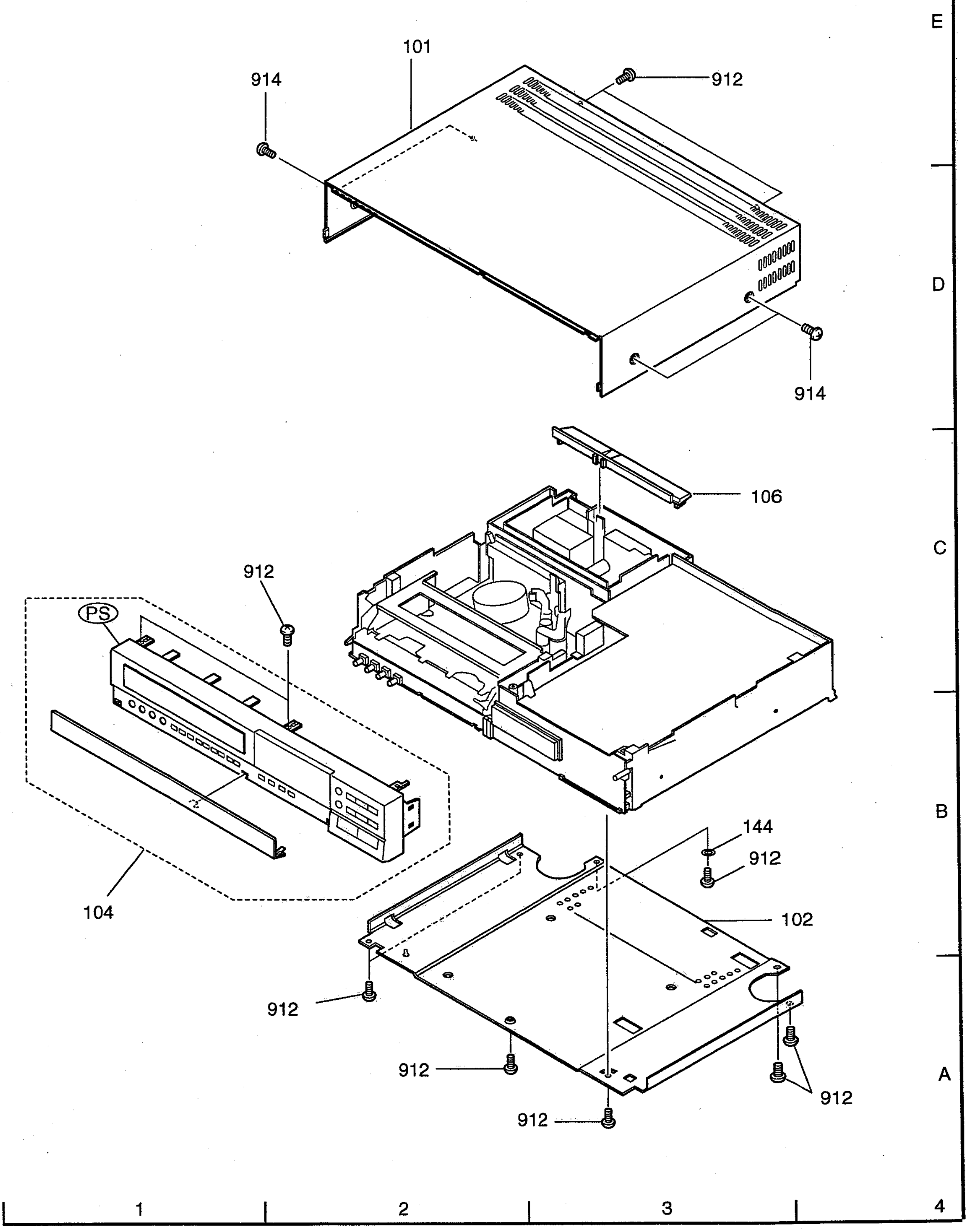
Table. 4-7

Display	Details
-	Remaining tape calculation incomplete
0	Near the end of tape
1	·
2	·
3	·
4	·
5	·
6	·
7	Near the start of tape

CHAPTER 5 EXPLODED VIEWS

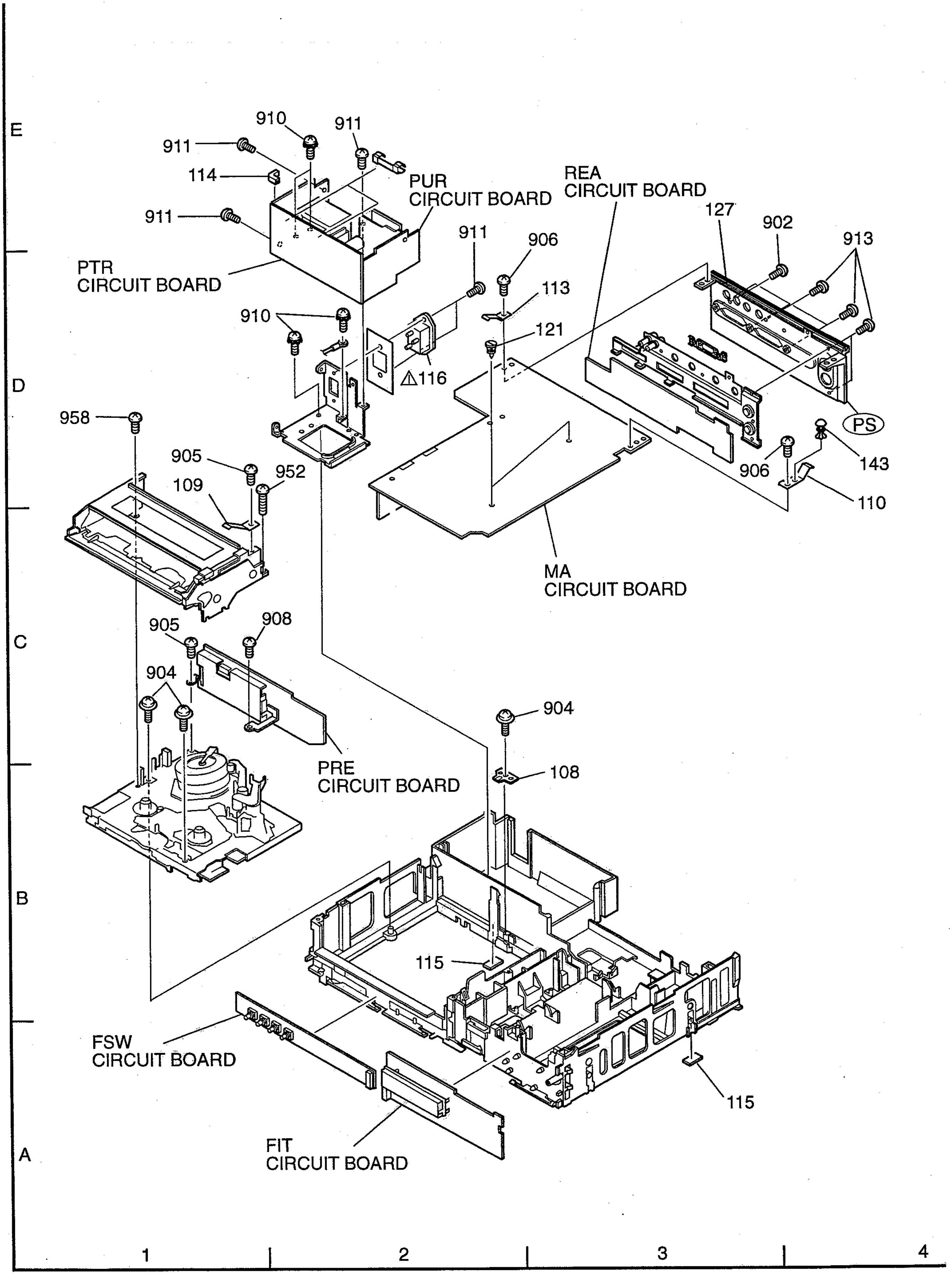
1. CABINET (CASES) SECTION

NOTE: The synthetic resin members that can be dismantled are shown by abbreviations using letters.



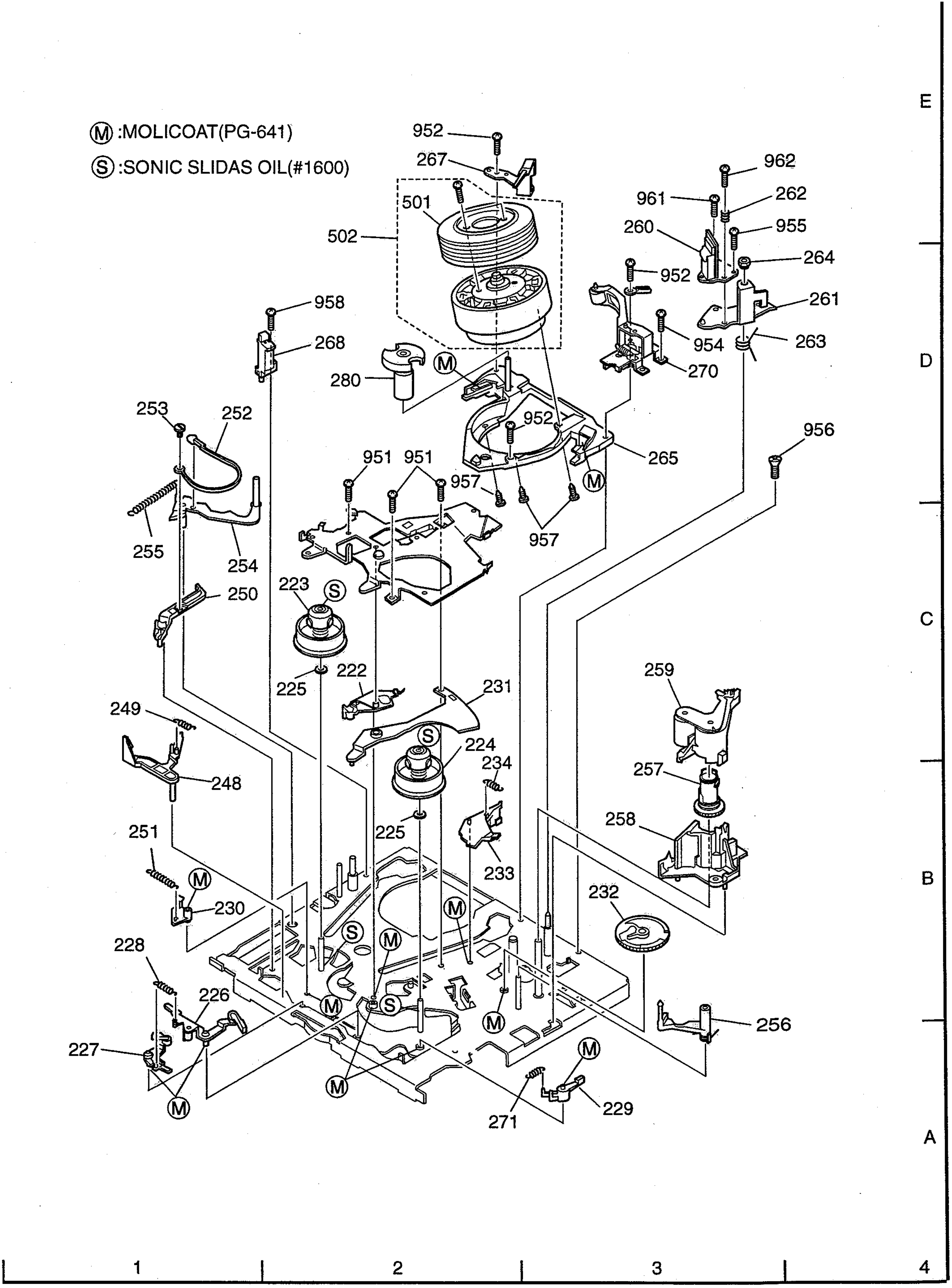
E
101
914
912
D
914
106
C
912
PS
B
144
912
104
102
912
912
A
912
912
1
2
3
4

2. CABINET (CIRCUIT BOARDS) SECTION

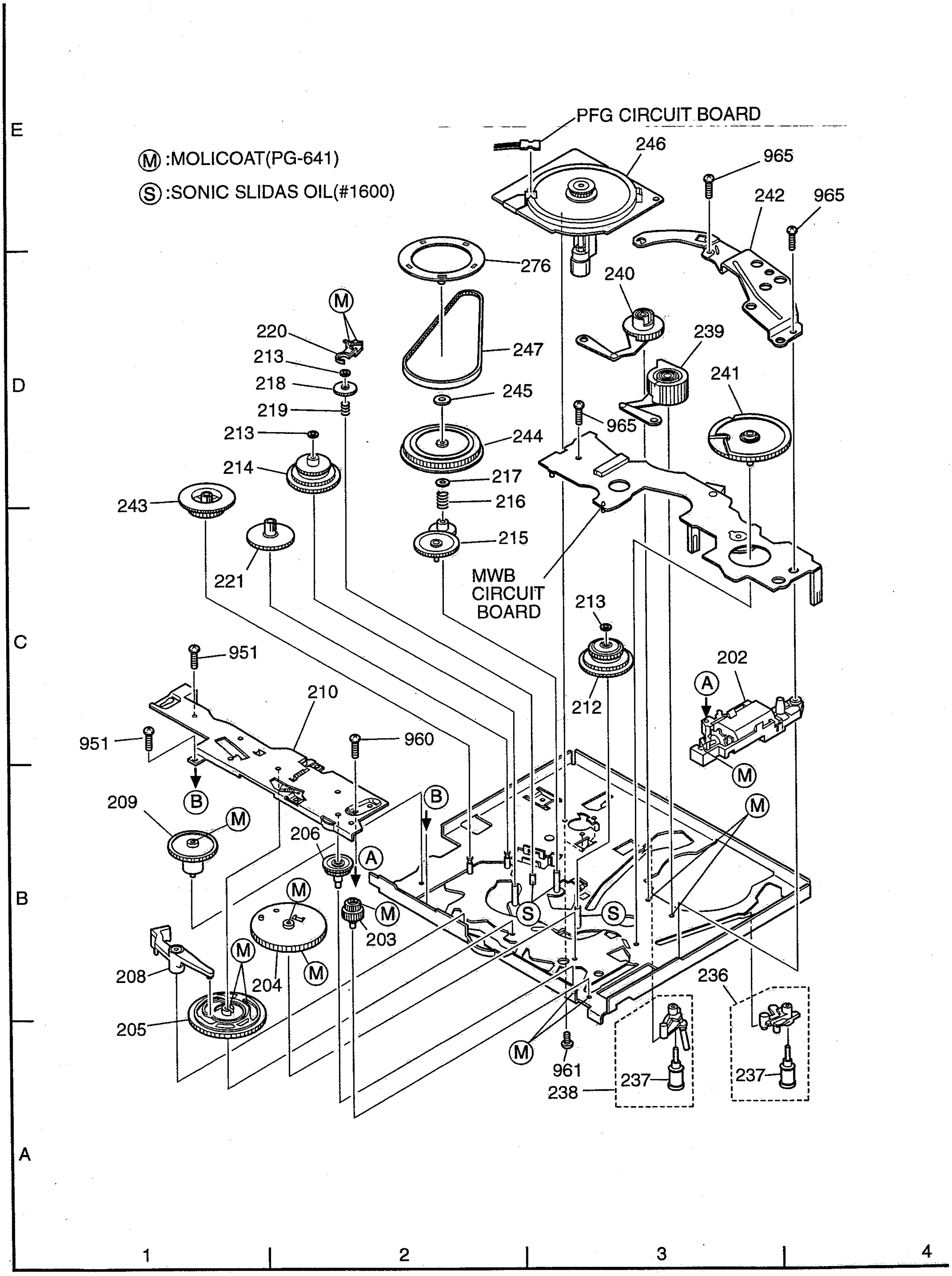


E
D
C
B
A
1
2
3
4
910
911
911
114
911
PUR CIRCUIT BOARD
REA CIRCUIT BOARD
127
902
913
911
906
PTR CIRCUIT BOARD
113
910
121
△116
PS
958
905
952
109
906
143
110
MA CIRCUIT BOARD
905
908
904
904
PRE CIRCUIT BOARD
108
115
FSW CIRCUIT BOARD
115
FIT CIRCUIT BOARD

3. CHASSIS (TOP VIEW) SECTION


Ⓜ :MOLICOAT(PG-641)
Ⓢ :SONIC SLIDAS OIL(#1600)
E
D
C
B
A
1
2
3
4
952
267
501
502
962
961
262
260
955
264
952
261
263
954
270
958
268
280
Ⓜ
253
252
952
265
Ⓜ
956
951
951
957
957
255
254
223
Ⓢ
250
225
222
231
259
249
Ⓢ
224
234
248
257
251
225
258
Ⓜ
233
230
232
Ⓜ
228
Ⓢ
Ⓜ
226
Ⓜ
Ⓢ
Ⓜ
256
227
Ⓜ
Ⓜ
Ⓜ
229
271

4. CHASSIS (BOTTOM VIEW) SECTION

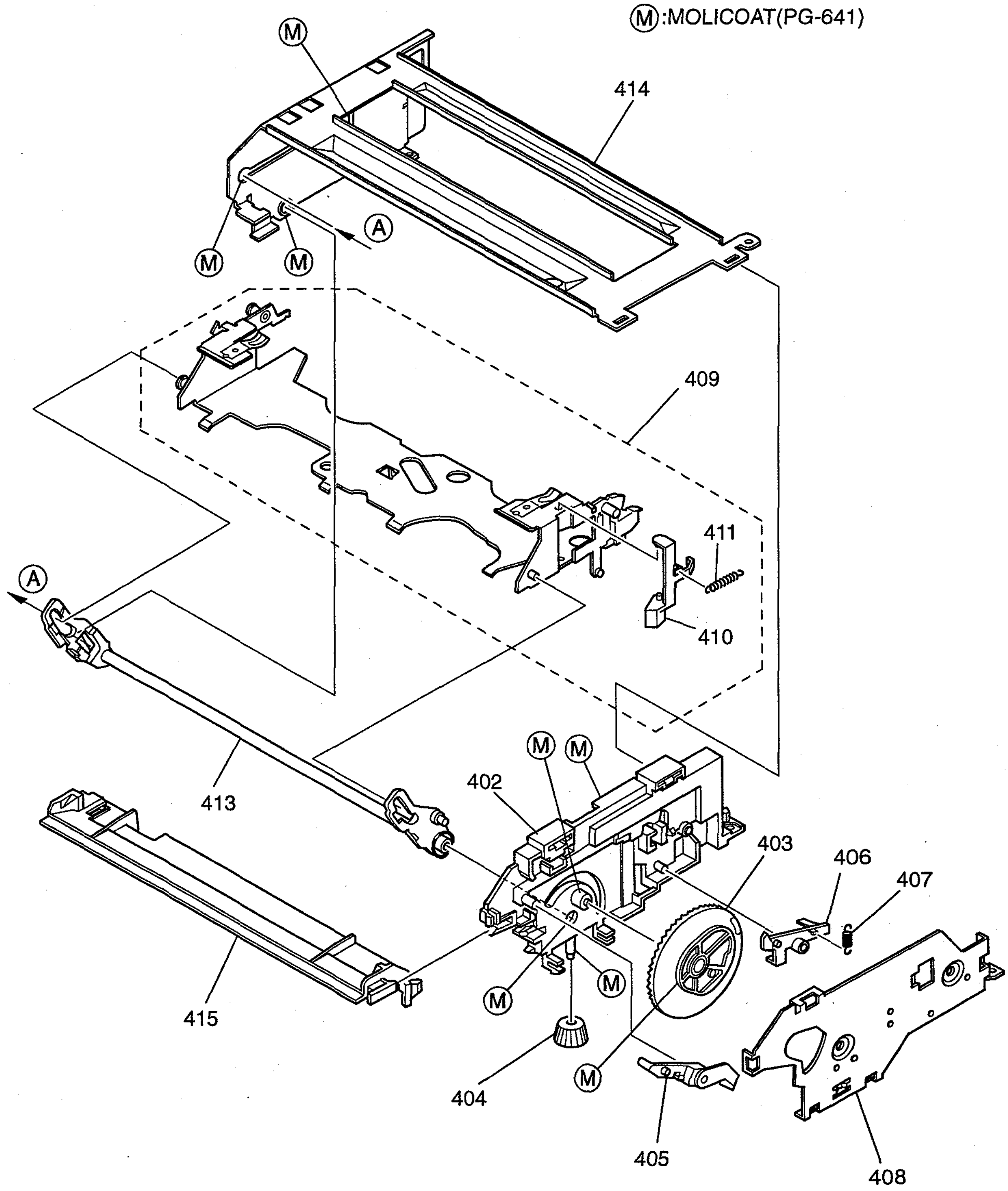


Ⓜ :MOLICOAT(PG-641)

Ⓢ :SONIC SLIDAS OIL(#1600)

PFG CIRCUIT BOARD
246
965
242
965
276
240
220
213
218
219
213
214
243
247
245
244
217
216
215
221
239
241
965
MWB
CIRCUIT
BOARD
213
212
202
A
M
951
210
951
960
B
B
209
M
206
A
M
M
203
M
S
S
M
208
204
M
205
M
M
961
238
237
236
237
E
D
C
B
A
1
2
3
4

5. CASSETTE LOADING MECHANISM SECTION



Ⓜ:MOLICOAT(PG-641)
Ⓜ
414
Ⓐ
Ⓜ
Ⓜ
409
411
Ⓐ
410
Ⓜ
Ⓜ
402
413
403
406
407
415
Ⓜ
Ⓜ
404
Ⓜ
405
408

E
D
C
B
A
1
2
3
4

CHAPTER 6 REPLACEMENT PARTS LIST

1. MECHANICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		MECHANISM SECTION
101	0A10957	COVER, TOP
102	6008672	COVER, BOTTOM
104	PH17654	PANEL, FRONT
106	6811834	PIECE, REAR
108	7415793	BRACKET
109	4826831	SPRING
110	6529161	PLATE
113	4842811	PLATE
114	6812411	HOLDER
115	4330291	FELT
⚠116	5699151	AC INLET
121	6898241	STUD
127	PH17122	PANEL, REAR
143	6714211	NYLON RIVET - 3MMD
144	8815114	WASHER
202	6500761	MOTOR, LOADING
203	6441371	GEAR
204	6441392	GEAR
205	6406341	GEAR
206	6441381	GEAR
208	6823171	ARM, OPERATION
209	6441421	GEAR
210	6500322	PLATE
212	KF10271	GEAR, TAKE-UP
213	7788347	WASHER
214	6406291	GEAR(R)
215	6401446	ARM, FR
216	6522978	SPRING
217	6500841	WASHER
218	6441434	GEAR, CHANGE
219	6522979	SPRING
220	6823183	ARM
221	6441411	GEAR
222	6823314	ARM
223	6416632	REEL, TABLE(S)
224	6404141	REEL, TABLE(T)
225	4583333	WASHER
226	4589851	ARM, BRAKE(R)
227	6823229	ARM, BRAKE(L)
228	6318613	SPRING
229	6823272	BRAKE
230	6823261	BRAKE
231	4588971	ARM
232	6823251	GEAR
233	KX21061	BRAKE
234	6558455	SPRING
236	6638943	BASE, GUIDE ROLLER(I)
237	KX12921	ROLLER, GUIDE
238	6638957	BASE, GUIDE ROLLER(O)
239	4587681	GEAR, LOADING(L)
240	4587671	GEAR, LOADING(R)
241	6823538	GEAR, MODE
242	KX10181	BRACKET
243	6823542	GEAR
244	6406332	PULLY, TAKE UP
245	6500841	WASHER
246	GP10204	MOTOR. CAPSTAN
247	6358101	BELT
248	6823424	ARM
249	6553361	SPRING
250	6823437	ARM, OPERATION
251	6553301	SPRING
252	6823475	BAND, TENSION
253	6823511	SHAFT
254	4587662	ARM
255	6553352	SPRING
256	6638936	ARM
257	6823521	GEAR, CAM
258	6823445	BRACKET
259	6500434	ROLLER, PRESSURE
260	5434153	HEAD
261	6500593	BASE, AC H6AD
262	6554301	SPRING
263	6553151	SPRING
264	7785673	NUT
265	6638895	BASE, CYLINDER
267	FU10191	BRUSH, CYLINDER
268	5423081	HEAD, FULL ERASE
270	NA10564	HEAD CLEANING ASSY
271	6558502	SPRING
276	6358591	CAP
280	6823452	ROLLER
402	6823613	BRACKET
403	6823621	GEAR
404	6823631	GEAR
405	6823642	ARM
406	6823652	ARM
407	6558531	SPRING
408	6500612	BRACKET
409	6500623	HOLDER
410	6823691	ARM
411	6558541	SPRING
413	6823665	ARM
414	6500672	BRACKET
415	6823701	HOLDER
501	5436758	CYLINDER, UPPER (CY-G4P0)
502	5436782	CYLINDER, LOWER (CY-G4PK)
902	8699408	SCREW
904	7781138	SCREW(3X10BT)
905	8671305	SCREW(2.6X5)
906	8699412	SCREW (3X12) BLACK
908	0711312	PAN HEAD SCREW - 2.6MMD X 12MM
910	7785351	SCREW(4XL4)
911	8691408	SXCREW(3X8)
912	8699410	SCREW(3X10)
913	8678410	DT BIND SCREW-3MMDX10MM
914	8698410	BT BIND SCREW-3MMDX10MM
951	0711304	SCREW(2.6X4)
952	0711312	PAN HEAD SCREW - 2.6MD X 12MM
954	0711306	PAN HEAD SCREW-2.6MMDX6MM
955	7773741	SCREW
956	4528181	SCREW
957	8650408	SCREW
958	0671308	DT SCREW-2.6MMDX8MM
960	8650914	SCREW(2.6X14S)
961	8741306	SCREW(2.6X6)
962	8741312	SPRING
965	MJ10251	SCREW(M2.6)

2. ELECTRICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		CAPACITORS
C0001	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0002	0209847	CERAMIC CHIP 82PF+-10% 50V
C0003	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0004	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0005	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0006	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0007	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0008	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0009	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0010	0209847	CERAMIC CHIP 82PF+-10% 50V
C0011	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0012	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C0013	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C0014	0800186	ELECTROLYTIC 47UF 16V
C0015	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0016	0209891	CERAMIC CHIP 12PF+-5% 50V
C0017	0800186	ELECTROLYTIC 47UF 16V
C0018	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0019	0209849	CERAMIC CHIP 390PF+-5% 50V
C0020	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0021	0800186	ELECTROLYTIC 47UF 16V
C0022	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0023	0800186	ELECTROLYTIC 47UF 16V
C1202	0890026	CERAMIC DISC 220PF+-10% 50V
C1206	0800039	ELECTROLYTIC 47UF 10V
C1207	0880009	POLYESTER FILM 0.01UF+-10% 50V
C1208	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1404	0880039	POLYESTER FILM 0.0047UF+-10% 50V
C1405	0800291	ELECTROLYTIC 10UF 16V
C1406	0800299	ELECTROLYTIC 22UF 16V
C1408	0880057	POLYESTER FILM 0.1UF+-10% 50V
C1409	0880059	POLYESTER FILM 0.15UF+-10% 50V
C1410	0800291	ELECTROLYTIC 10UF 16V
C1411	0209942	CERAMIC CHIP 100PF+-5% 50V
C1412	0800279	CAPACITOR 1.0UF+-20% 50V
C1413	0800279	CAPACITOR 1.0UF+-20% 50V
C1414	0800279	CAPACITOR 1.0UF+-20% 50V
C1415	0880046	POLYESTER FILM 0.015UF+-10% 50V
C1416	0800291	ELECTROLYTIC 10UF 16V
C1417	0800291	ELECTROLYTIC 10UF 16V
C1418	0880033	MYLAR 1500PF+-10% 50V
C1419	0800291	ELECTROLYTIC 10UF 16V
C1420	0800308	ELECTROLYTIC 33UF 16V
C1421	0893037	CERAMIC CHIP 3300PF+-10% 50V
C1422	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1423	0209946	CERAMIC CHIP 220PF+-5% 50V
C1424	0268449	MYLAR 0.047UF+-5% 100V
C1425	0800291	ELECTROLYTIC 10UF 16V
C1426	0202159	CERAMIC CHIP 680PF+-5% 50V
C1430	0880053	POLYESTER FILM 0.047UF+-10% 50V
C1431	0880198	CAPACITOR 0.22UF 50V
C1432	0880053	POLYESTER FILM 0.047UF+-10% 50V
C1433	0880044	POLYESTER FILM 0.01UF+-10% 50V
C1434	0800279	CAPACITOR 1.0UF+-20% 50V
C1437	0880055	MYLAR 0.068UF+-10% 50V
C1439	0800286	CAPASITOR 4.7UF+-20% 25V
C1440	0800291	ELECTROLYTIC 10UF 16V
C1441	0800326	ELECTROLYTIC 100UF 16V
C1442	0893063	CERAMIC CHIP 0.022UF+80-20% 25V
C1443	0800291	ELECTROLYTIC 10UF 16V
C1501	0893082	CERAMIC CHIP 0.022UF+80-20% 50V
C1502	0207457	ELECTROLYTIC 4.7UF 50V

SYMBOL NO	P-NO	DESCRIPTION
C1504	0209942	CERAMIC CHIP 100PF+-5% 50V
C1505	0800122	ELECTROLYTIC 10UF 16V
C1506	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1507	0800118	ELECTROLYTIC 4.7UF 35V
C1508	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1509	0209942	CERAMIC CHIP 100PF+-5% 50V
C1510	0209936	CERAMIC CHIP 33PF+-5% 50V
C1511	0209937	CERAMIC CHIP 39PF+-5% 50V
C1512	0209943	CERAMIC DISC 120PF+-5% 50V
C1513	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1515	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1516	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1518	0209946	CERAMIC CHIP 220PF+-5% 50V
C1601	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1602	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1603	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1604	0800309	ELECTROLYTIC 33UF+-20% 25V
C1605	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1606	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1607	0893084	CERAMIC CHIP 0.047UF+80-20% 50V
C1608	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1609	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1610	0800128	ELECTROLYTIC 22UF 16V
C1611	0209934	CERAMIC CHIP 22PF+-5% 50V
C1612	0800297	ELECTROLYTIC 22UF 6.3V
C1613	0800141	ELECTROLYTIC 47UF 16V
C1614	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1615	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1616	0209942	CERAMIC CHIP 100PF+-5% 50V
C1617	0209938	CERAMIC CHIP 47PF+-5% 50V
C1619	0209950	CERAMIC CHIP 470PF+-5% 50V
C1620	0800279	CAPACITOR 1.0UF+-20% 50V
C1621	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1622	0893082	CERAMIC CHIP 0.022UF+80-20% 50V
C1625	0209942	CERAMIC CHIP 100PF+-5% 50V
C1626	0800291	ELECTROLYTIC 10UF 16V
C1627	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1628	0209942	CERAMIC CHIP 100PF+-5% 50V
C1629	0209906	CERAMIC DISC 820PF+-5% 50V
C1630	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1631	0209943	CERAMIC DISC 120PF+-5% 50V
C1632	0209948	CERAMIC CHIP 330PF+-5% 50V
C1633	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1634	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1635	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1638	0893027	CERAMIC CHIP 0.1UF+-10% 25V
C1639	0800291	ELECTROLYTIC 10UF 16V
C1642	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1721	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1724	0800317	ELECTROLYTIC 47UF 16V
C1725	0800317	ELECTROLYTIC 47UF 16V
C1726	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1727	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1729	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1730	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1731	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1732	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1852	0800204	CERAMIC CHIP 100PF+-20% 25V
C1853	0800202	ELECTROLYTIC 10UF 25V
C1855	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C1856	AL10217F	ELECTROLYIC 1000UF 16V
C1857	0800203	ELECTROLYTIC 100UF 50V
C1858	0800204	CERAMIC CHIP 100PF+-20% 25V
C1859	0800204	CERAMIC CHIP 100PF+-20% 25V
C1867	0255786	ELECTROLYTIC 4700UF 35V

SYMBOL NO	P-NO	DESCRIPTION
⚠C1891	AJ10294	CERAMIC CAPACITOR 4700PF+-20% 125V
C1902	0800291	ELECTROLYTIC 10UF 16V
C1903	0880185	CAPACITOR 0.022UF+-5% 50V
C1904	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1905	0209933	CERAMIC CHIP 18PF+-5% 50V
C1906	0209934	CERAMIC CHIP 22PF+-5% 50V
C1907	0209927	CERAMIC CHIP 7.0PF+-0.5% 50V
C1908	0209927	CERAMIC CHIP 7.0PF+-0.5% 50V
C1909	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1910	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1911	0800316	ELECTROLYTIC 47UF 10V
C1912	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1913	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1914	0800374	ELECTROLYTIC 4700UF 10V
C1915	0893084	CERAMIC CHIP 0.047UF+80-20% 50V
C1916	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1917	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2101	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2851	0880014	POLYESTER FILM 0.047UF+-10% 50V
C2852	0207714	ELECTROLYTIC 100UF 63V
C2853	0207713	ELECTROLYTIC 22UF 63V
C2854	0800195	CERAMIC CHIP 1.0PF+-20% 50V
C2855	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2856	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2857	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C2858	0800201	ELECTROLYTIC 33UF 16V
C2859	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C2860	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C2861	0800202	ELECTROLYTIC 10UF 25V
C2865	0890022	CERAMIC DISC 100PF+-10% 50V
C2870	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2872	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C3001	0209946	CERAMIC CHIP 220PF+-5% 50V
C3002	0209946	CERAMIC CHIP 220PF+-5% 50V
C3003	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C3004	0209946	CERAMIC CHIP 220PF+-5% 50V
C3006	0209946	CERAMIC CHIP 220PF+-5% 50V
C3011	0209946	CERAMIC CHIP 220PF+-5% 50V
C3012	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3013	0800326	ELECTROLYTIC 100UF 16V
C3016	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3018	0209946	CERAMIC CHIP 220PF+-5% 50V
C3019	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3020	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3021	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3022	0209934	CERAMIC CHIP 22PF+-5% 50V
C3023	0209931	CERAMIC CHIP 12PF+-5% 50V
C3024	0209943	CERAMIC DISC 120PF+-5% 50V
C3025	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3026	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3027	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3028	0800316	ELECTROLYTIC 47UF 10V
C3029	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3030	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3031	0893029	ELECTROLYTIC 0.15UF+-10% 25V
C3032	0209944	CERAMIC CHIP 150PF+-5% 50V
C3033	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3201	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3202	0800316	ELECTROLYTIC 47UF 10V
C3203	0800286	CAPASITOR 4.7UF+-20% 25V
C3204	0800291	ELECTROLYTIC 10UF 16V
C3205	0890043	CERAMIC DISC 0.01UF+-20% 16V
C3206	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3207	0800291	ELECTROLYTIC 10UF 16V
C3208	0800291	ELECTROLYTIC 10UF 16V
C3209	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3210	0800317	ELECTROLYTIC 47UF 16V
C3211	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C3212	0800291	ELECTROLYTIC 10UF 16V
C3213	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3214	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3215	0800317	ELECTROLYTIC 47UF 16V
C3216	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C3217	0800279	CAPACITOR 1.0UF+-20% 50V
C3218	0800279	CAPACITOR 1.0UF+-20% 50V
C3221	0209945	CERAMIC DISC 180PF+-5% 50V
C3223	0209939	CERAMIC CHIP 56PF+-5% 50V
C3224	0800291	ELECTROLYTIC 10UF 16V
C3225	0209949	CERAMIC DISC 390PF+-5% 50V
C3226	0209938	CERAMIC CHIP 47PF+-5% 50V
C3227	0209936	CERAMIC CHIP 33PF+-5% 50V
C3228	0209941	CERAMIC DISC 82PF+-5% 50V
C3229	0800291	ELECTROLYTIC 10UF 16V
C3230	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3231	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C3232	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3233	0800279	CAPACITOR 1.0UF+-20% 50V
C3234	0800279	CAPACITOR 1.0UF+-20% 50V
C3235	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C3236	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3237	0209940	CERAMIC CHIP 68PF+-5% 50V
C3238	0800317	ELECTROLYTIC 47UF 16V
C3239	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3240	0800317	ELECTROLYTIC 47UF 16V
C3241	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3242	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3243	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C3244	0800317	ELECTROLYTIC 47UF 16V
C3245	0800317	ELECTROLYTIC 47UF 16V
C3246	0209940	CERAMIC CHIP 68PF+-5% 50V
C3247	0800291	ELECTROLYTIC 10UF 16V
C3248	0209934	CERAMIC CHIP 22PF+-5% 50V
C3249	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C3250	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C3251	0209928	CERAMIC DISC 8PF+-5% 50V
C3252	0209937	CERAMIC CHIP 39PF+-5% 50V
C3254	0209940	CERAMIC CHIP 68PF+-5% 50V
C3255	0209935	CERAMIC CHIP 27PF+-5% 50V
C3256	0209937	CERAMIC CHIP 39PF+-5% 50V
C3257	0800271	ELECTROLYTIC 0.1UF 50V
C3260	0893029	ELECTROLYTIC 0.15UF+-10% 25V
C3261	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3264	0209928	CERAMIC DISC 8PF+-5% 50V
C3265	0209938	CERAMIC CHIP 47PF+-5% 50V
C3266	0890043	CERAMIC DISC 0.01UF+-20% 16V
C3301	0800273	ELECTROLYTIC 0.22UF 50V
C3302	0209948	CERAMIC CHIP 330PF+-5% 50V
C3303	0893015	CERAMIC CHIP 0.012UF+-10% 25V
C3304	0800277	ELECTROLYTIC 0.47UF 50V
C3305	0800291	ELECTROLYTIC 10UF 16V
C3306	0209935	CERAMIC CHIP 27PF+-5% 50V
C3307	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3308	0800315	ELECTROLYTIC 47UF 6.3V
C3309	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3310	0800282	ELECTROLYTIC 2.2UF 50V
C3311	0800277	ELECTROLYTIC 0.47UF 50V
C3312	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3313	0800326	ELECTROLYTIC 100UF 16V
C3314	0800291	ELECTROLYTIC 10UF 16V
C3320	0893014	CERAMIC CHIP 0.01UF+-10% 25V

SYMBOL NO	P-NO	DESCRIPTION
C3321	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C3322	0800317	ELECTROLYTIC 47UF 16V
C3323	0800352	ELECTROLYTIC 470UF 10V
C3334	0800316	ELECTROLYTIC 47UF 10V
C3335	0893027	CERAMIC CHIP 0.1UF+-10% 25V
C3336	0209928	CERAMIC DISC 8PF+-5% 50V
C3337	0890088	CERAMIC DISC 1200PF+-10% 50V
C3338	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3339	0209941	CERAMIC DISC 82PF+-5% 50V
C3340	0893032	CERAMIC CHIP 1200PF+-10% 50V
C3341	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3342	0209936	CERAMIC CHIP 33PF+-5% 50V
C3343	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3344	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3345	0890043	CERAMIC DISC 0.01UF+-20% 16V
C3346	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3347	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3348	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C3349	0209937	CERAMIC CHIP 39PF+-5% 50V
C3350	0209937	CERAMIC CHIP 39PF+-5% 50V
		RESISTORS
R0001	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0002	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R0003	0103824	CHIP RESISTOR 27 OHM+-5% 0.1W
R0004	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0005	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0006	0103824	CHIP RESISTOR 27 OHM+-5% 0.1W
R0007	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0008	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R0009	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0010	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0011	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R0012	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0013	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R0014	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0015	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0016	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0017	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0018	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0019	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R0022	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0023	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0024	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1131	0101718	RESISTOR 75 OHM+-5% 1/6W
R1139	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1201	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1202	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1203	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1204	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1206	0700064	CARBON FILM 56KOHM+-5% 1/8W
R1207	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1208	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1209	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1210	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1211	0101821	CARBON FILM 100 OHM+-5% 1/4W
R1212	0101821	CARBON FILM 100 OHM+-5% 1/4W
R1215	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1221	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1222	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1223	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1224	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1225	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1226	0700036	CARBON FILM 470 OHM+-5% 1/8W

SYMBOL NO	P-NO	DESCRIPTION
R1227	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1228	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1229	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1230	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1231	0700056	CARBON FILM 15KOHM+-5% 1/8W
R1232	0700068	CARBON FILM 120KOHM+-5% 1/8W
R1233	0700062	CARBON FILM 39KOHM+-5% 1/8W
R1234	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1235	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1236	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1237	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1238	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1239	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1240	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1241	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1242	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1243	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1244	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1245	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1246	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1247	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1248	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1249	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1250	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1301	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1302	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1303	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1304	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1305	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1306	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1307	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1308	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1309	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1310	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1311	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1312	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1313	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1314	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1315	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1316	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1317	0700057	CARBON FILM 18KOHM+-5% 1/8W
R1318	0700057	CARBON FILM 18KOHM+-5% 1/8W
R1402	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1403	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1405	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1406	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R1407	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R1408	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1409	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1410	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1411	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1413	0103819	CHIP RESISTOR 10 OHM+-5% 0.1W
R1414	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R1415	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1416	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1417	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1418	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1419	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1420	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1422	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R1423	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1424	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1425	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R1426	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1427	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R1428	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1429	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1430	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1431	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
⚠R1432	0101725	CHIP RESISTOR 2.2 OHM+-5% 1/4W
R1433	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1434	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1435	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1436	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1439	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1441	0700059	CARBON FILM 27KOHM+-5% 1/8W
R1443	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1444	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1445	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1446	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1447	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1449	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1450	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R1451	0103870	CHIP RESISTOR 180KOHM+-5% 0.1W
R1452	0103828	CHIP RESISTOR 56 OHM+-5% 0.1W
R1453	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1501	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1502	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1505	0103875	CHIP RESISTOR 470KOHM+-5% 0.1W
R1507	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R1509	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1510	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R1511	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1513	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1514	0103828	CHIP RESISTOR 56 OHM+-5% 0.1W
R1515	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1516	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1517	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1601	0700058	CARBON FILM 22KOHM+-5% 1/8W
R1602	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1603	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1604	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1605	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1606	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1607	0103870	CHIP RESISTOR 180KOHM+-5% 0.1W
R1608	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1609	0103880	CHIP RESISTOR 1.5MOHM+-10% 0.1W
R1610	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1611	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1612	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1613	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1614	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1615	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1616	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1617	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1618	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1619	0700047	CARBON FILM 3.3KOHM+-5% 1/8W
R1620	0103838	RESISTOR CHIP 390 OHM+-5% 0.1W
R1621	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1622	0104122	CHIP RESISTOR 33KOHM+-1% 0.1W
R1623	0104122	CHIP RESISTOR 33KOHM+-1% 0.1W
R1624	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1625	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1626	0104123	CHIP RESISTOR 8.2KOHM+-1% 1/10W
R1627	0104111	CHIP RESISTOR 10KOHM+-1% 1/10W
R1632	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1633	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1636	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1637	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1638	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1639	0700065	CARBON FILM 68KOHM+-5% 1/8W
R1640	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1641	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1642	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1643	0103878	CHIP RESISTOR 820KOHM+-5% 0.1W
R1644	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1645	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1646	0700062	CARBON FILM 39KOHM+-5% 1/8W
R1647	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1648	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1649	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1650	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1651	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1652	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1653	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1654	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1655	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1656	0103834	CHIP RESISTOR 180 OHM+-5% 0.1W
R1657	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1658	0700062	CARBON FILM 39KOHM+-5% 1/8W
R1659	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1660	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1661	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1662	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1663	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1664	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1666	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1667	0700067	CARBON FILM 100KOHM+-5% 1/8W
R1669	0103877	CHIP RESISTOR 680KOHM+-5% 0.1W
R1671	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1673	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R1674	0103869	CHIP RESISTOR 150KOHM+-5% 0.1W
R1675	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1676	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1681	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1682	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1683	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1684	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1685	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1686	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1687	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1688	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1693	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1694	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1736	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1737	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1738	0111276	METAL FILM 100 OHM+-5% 2W
R1739	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1740	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1741	0111276	METAL FILM 100 OHM+-5% 2W
R1742	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1743	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1759	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R1760	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1761	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1762	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1763	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1765	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1766	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1768	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1769	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1770	0700058	CARBON FILM 22KOHM+-5% 1/8W
R1773	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1774	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1775	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R1777	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1778	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1782	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1783	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1784	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1786	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1788	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1790	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1851	0101844	CARBON FILM 8.2KOHM+-5% 1/4W
⚠R1871	0101712	FUSE RESISTOR 6.8 OHM+-5% 1/4W
R1884	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1901	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1902	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1903	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1904	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1905	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1906	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1907	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1908	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1909	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1910	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1911	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1912	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1913	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1914	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1915	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1916	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1917	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1918	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1919	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1920	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1921	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1922	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1923	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1924	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
⚠R1925	0101711	FUSE RESISTOR 2.2 OHM+-5% 1/4W
R1926	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1927	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1928	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1929	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1930	0700058	CARBON FILM 22KOHM+-5% 1/8W
R1931	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1932	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1933	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1934	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1935	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1936	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1937	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1939	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1940	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1941	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1942	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1944	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1945	0700047	CARBON FILM 3.3KOHM+-5% 1/8W
R1946	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1947	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R1948	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1949	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1951	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1953	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1954	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1955	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1956	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1957	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1958	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1959	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1960	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1961	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1962	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1963	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1964	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1965	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1966	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1967	0103881	CHIP RESISTOR 2.2MOHM+-10% 0.1W
R1968	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1969	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1970	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1971	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1972	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1973	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1975	0700062	CARBON FILM 39KOHM+-5% 1/8W
R1979	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1980	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1981	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1982	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1983	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1984	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1985	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1986	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1987	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1988	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1992	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1993	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1994	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1995	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1996	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1997	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1998	0103834	CHIP RESISTOR 180OHM+-5% 0.1W
R1999	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R2851	0700074	CARBON FILM 330KOHM+-5% 1/8W
R2852	0700057	CARBON FILM 18KOHM+-5% 1/8W
R2859	0101756	CHIP RESISTOR 1KOHM+-1% 1/8W
R2860	1109024	METAL FILM 294 OHM+-1% 1/8W
R2868	0700046	CARBON FILM 2.7KOHM+-5% 1/8W
R2869	0101944	CARBON FILM 8.2KOHM+-5% 1/4W
R2870	0101944	CARBON FILM 8.2KOHM+-5% 1/4W
R3004	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R3005	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R3006	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R3007	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3014	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R3023	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3024	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R3027	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R3028	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R3029	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3031	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R3032	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R3033	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3034	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R3035	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R3036	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3037	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R3038	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3039	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R3040	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R3041	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3042	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3043	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3044	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R3045	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R3202	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R3203	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R3204	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R3205	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R3206	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R3207	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R3208	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3209	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R3210	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3211	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R3212	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R3214	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R3215	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3216	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3217	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R3218	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3219	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3220	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3221	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3222	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R3223	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R3224	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3225	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R3226	0700053	CARBON FILM 8.2KOHM+-5% 1/8W
R3228	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R3229	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R3230	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3231	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R3232	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3233	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R3234	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3235	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3236	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R3237	0700042	CARBON FILM 1.2KOHM+-5% 1/8W
R3238	0103836	CHIP RESISTOR 270 OHM+-5% 0.1W
R3239	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3242	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R3243	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R3244	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R3245	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3246	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3247	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3249	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R3251	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R3255	0700061	CARBON FILM 33KOHM+-5% 1/8W
R3256	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R3257	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R3258	0700051	CARBON FILM 5.6KOHM+-5% 1/8W
R3301	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3302	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3303	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R3304	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R3305	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R3306	0103881	CHIP RESISTOR 2.2MOHM+-10% 0.1W
R3307	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R3308	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R3309	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R3310	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R3311	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R3312	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R3313	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R3314	0700025	CARBON FILM 68 OHM+-5% 1/8W
R3325	0700037	CARBON FILM 560 OHM+-5% 1/8W
R3326	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R3327	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3328	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R3329	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R3330	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3331	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R3332	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R3333	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3334	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3335	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R3336	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R3337	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3338	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R3339	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R3340	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R3341	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R3342	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R3343	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R3344	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R3345	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R3346	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R3347	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R3348	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R3349	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R3350	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3351	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R3352	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R3353	0700036	CARBON FILM 470 OHM+-5% 1/8W
R3354	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
RT1301	AY10212	VARIABLE RESISTOR 10KOHM
RT1302	AY10212	VARIABLE RESISTOR 10KOHM
RT1303	AY10211	VARIABLE RESISTOR 10KOHM
RT1304	AY10211	VARIABLE RESISTOR 10KOHM
RT1401	AW10209R	SEMI VARIABLE 47KOHM
RT3201	AW10186R	VARIBLE RESISTOR 4.7KOHM
RT3202	AW10188R	SEMI VARIABLE 22KOHM
RT3203	AW10208R	SEMI VARIABLE 22KOHM+-25% 0.3W
RT3204	AW10188R	SEMI VARIABLE 22KOHM
RT3205	AW10188R	SEMI VARIABLE 22KOHM
RT3206	AW10187R	VARIBLE RESISTOR 10KOHM
RT3207	AW10185R	SEMI VARIABLE 2.2KOHM
RT3301	AW10188R	SEMI VARIABLE 22KOHM
		SEMI-CONDUCTORS
D0001	5328301	DIODE MA151WK (MT)
D0002	5328301	DIODE MA151WK (MT)
D0004	5328301	DIODE MA151WK (MT)
D0005	5339131	DIODE 1SS254
D1201	5339551	DIODE SS1J4
D1301	5339131	DIODE 1SS254
D1405	5328307	DIODE MA151WK
D1407	5339131	DIODE 1SS254
D1410	5339131	DIODE 1SS254
D1411	5339131	DIODE 1SS254
D1412	5339131	DIODE 1SS254
D1413	5328307	DIODE MA151WK
D1414	5339131	DIODE 1SS254
D1415	5328305	DIODE MA151WA
D1420	5328307	DIODE MA151WK
D1601	5339233	DIODE SDI-35-400AT
D1602	5339233	DIODE SDI-35-400AT
D1603	5339131	DIODE 1SS254
D1604	5339131	DIODE 1SS254
D1605	5339131	DIODE 1SS254
D1609	1330011	DIODE DINS4

SYMBOL NO	P-NO	DESCRIPTION
D1701	5339233	DIODE SDI-35-400AT
D1702	5339233	DIODE SDI-35-400AT
⚠D1851	5333351	DIODE D3SBA10
⚠D1852	5333351	DIODE D3SBA10
D1856	5339231	DIODE 1SR35-100A
D1857	5339231	DIODE 1SR35-100A
D1901	5339131	DIODE 1SS254
D1904	5339551	DIODE SS1J4
D1905	5339131	DIODE 1SS254
D1908	5339551	DIODE SS1J4
D1909	5339551	DIODE SS1J4
D1910	5339551	DIODE SS1J4
D1911	5339131	DIODE 1SS254
D2101	5380933	LED GL451
D2851	5339171	DIODE 1SS130M
D2852	5339171	DIODE 1SS130M
D2853	5339171	DIODE 1SS130M
D2854	5339171	DIODE 1SS130M
D3201	5339131	DIODE 1SS254
D3202	5339131	DIODE 1SS254
D3204	5339131	DIODE 1SS254
D3205	5339551	DIODE SS1J4
IC0001	1362321	IC HA118162NT
IC1201	1349041	IC UPD16312GB-3B4
IC1401	1347092	IC BA7795LS
IC1402	5300641	IC BA7755
IC1601	CP10291	IC BA6209
IC1602	5364594	IC NJM2903D
IC1603	5350601	IC NJM4558D
IC1604	5364594	IC NJM2903D
IC1605	1350792	IC TC4S66F
IC1606	1350792	IC TC4S66F
IC1701	CP12571	IC M34510M2-179SP
IC1702	CK19602R	IC RN5VS45AA
IC1901	CK22013	IC HD6433977RF
IC1903	CK14881	IC AT24C02N
IC1904	5359901	IC UPD4066C
IC1905	1366743	IC S-80725AL-AN
IC2101	5327521	PHOTO TRANSISTOR SPI-315-C
IC2102	5327521	PHOTO TRANSISTOR SPI-315-C
IC2851	1361882	IC PQ30RV21
IC2852	1341956	IC M5278D09
IC3201	CP12521	IC LA7195
IC3202	1373682	IC HT7323A
IC3203	5362263	IC MSM6965RS
IC3301	1362401	IC M52096SP
IC3303	CK16671R	IC BA7653AF
IC3305	1347111	IC M52363SP
Q0001	5328793	TRANSISTOR DTC144EK
Q0002	5328972	TRANSISTOR 2SC2412K-BRT
Q0003	5328972	TRANSISTOR 2SC2412K-BRT
Q0004	5328972	TRANSISTOR 2SC2412K-BRT
Q0005	5328793	TRANSISTOR DTC144EK
Q0006	5328972	TRANSISTOR 2SC2412K-BRT
Q1403	CA11262R	TRANSISTOR DTC144EKA
Q1407	CA11262R	TRANSISTOR DTC144EKA
Q1408	CA11262R	TRANSISTOR DTC144EKA
Q1409	CA11262R	TRANSISTOR DTC144EKA
Q1410	CA11252R	TRANSISTOR DTA144EKA
Q1411	1320004	TRANSISTOR 2SA854SQR
Q1412	5328974	TRANSISTOR 2SC2412K
Q1413	5323172	TRANSISTOR 2SC1214CD
Q1414	5328974	TRANSISTOR 2SC2412K
Q1415	CA11262R	TRANSISTOR DTC144EKA
Q1417	CA11262R	TRANSISTOR DTC144EKA
Q1418	CA11262R	TRANSISTOR DTC144EKA
Q1419	CA11252R	TRANSISTOR DTA144EKA
Q1420	CA11262R	TRANSISTOR DTC144EKA
Q1421	CA11262R	TRANSISTOR DTC144EKA
Q1422	CA11261R	TRANSISTOR DTC124EKA
Q1424	CA11262R	TRANSISTOR DTC144EKA
Q1425	CA11262R	TRANSISTOR DTC144EKA
Q1427	CA11262R	TRANSISTOR DTC144EKA
Q1428	CA11262R	TRANSISTOR DTC144EKA
Q1501	5328974	TRANSISTOR 2SC2412K
Q1510	CA11272R	TRANSISTOR 2SA1037K-R
Q1511	5328974	TRANSISTOR 2SC2412K
Q1601	CA11262R	TRANSISTOR DTC144EKA
Q1602	5328974	TRANSISTOR 2SC2412K
Q1603	5328974	TRANSISTOR 2SC2412K
Q1604	5328974	TRANSISTOR 2SC2412K
Q1609	CA11262R	TRANSISTOR DTC144EKA
Q1610	CA11262R	TRANSISTOR DTC144EKA
Q1611	CA11252R	TRANSISTOR DTA144EKA
Q1612	CA11262R	TRANSISTOR DTC144EKA
Q1613	CA11262R	TRANSISTOR DTC144EKA
Q1614	CA11252R	TRANSISTOR DTA144EKA
Q1615	CA11262R	TRANSISTOR DTC144EKA
Q1616	CA11262R	TRANSISTOR DTC144EKA
Q1618	CA11262R	TRANSISTOR DTC144EKA
Q1620	5328974	TRANSISTOR 2SC2412K
Q1621	CA11272R	TRANSISTOR 2SA1037K-R
Q1622	5328974	TRANSISTOR 2SC2412K
Q1713	CA11262R	TRANSISTOR DTC144EKA
Q1715	1323082	TRANSISTOR 2SA1036K
Q1716	1323082	TRANSISTOR 2SA1036K
Q1718	CA11262R	TRANSISTOR DTC144EKA
Q1719	CA11262R	TRANSISTOR DTC144EKA
Q1720	CA11262R	TRANSISTOR DTC144EKA
Q1721	CA11262R	TRANSISTOR DTC144EKA
Q1723	CA11262R	TRANSISTOR DTC144EKA
Q1724	CA11262R	TRANSISTOR DTC144EKA
Q1726	CA11262R	TRANSISTOR DTC144EKA
Q1851	CF10311	TRANSISTOR 2SD2398
Q1902	CA11251R	TRANSISTOR DTA124EKA
Q1904	5328974	TRANSISTOR 2SC2412K
Q1905	5327262	TRANSISTOR 2SB1326
Q1906	CA11261R	TRANSISTOR DTC124EKA
Q1907	CA11262R	TRANSISTOR DTC144EKA
Q1909	5328974	TRANSISTOR 2SC2412K
Q1910	5328974	TRANSISTOR 2SC2412K
Q2101	5324661	PHOTO TRANSISTOR PT-483F1H
Q2102	5324661	PHOTO TRANSISTOR PT-483F1H
Q2851	5327032	TRANSISTOR 2SA673D
Q2863	CF10311	TRANSISTOR 2SD2398
Q3005	CA11272R	TRANSISTOR 2SA1037K-R
Q3007	5328974	TRANSISTOR 2SC2412K
Q3008	5328974	TRANSISTOR 2SC2412K
Q3009	CA11272R	TRANSISTOR 2SA1037K-R
Q3010	5328974	TRANSISTOR 2SC2412K
Q3011	5328974	TRANSISTOR 2SC2412K
Q3201	5328974	TRANSISTOR 2SC2412K
Q3203	CA11272R	TRANSISTOR 2SA1037K-R
Q3204	CA11272R	TRANSISTOR 2SA1037K-R
Q3205	CA11262R	TRANSISTOR DTC144EKA
Q3206	5328974	TRANSISTOR 2SC2412K
Q3208	5328974	TRANSISTOR 2SC2412K
Q3209	5328974	TRANSISTOR 2SC2412K
Q3210	5328974	TRANSISTOR 2SC2412K
Q3211	CA11272R	TRANSISTOR 2SA1037K-R

SYMBOL NO	P-NO	DESCRIPTION
Q3217	5328974	TRANSISTOR 2SC2412K
Q3218	5328974	TRANSISTOR 2SC2412K
Q3219	CA11262R	TRANSISTOR DTC144EKA
Q3301	CA11272R	TRANSISTOR 2SA1037K-R
Q3302	CA11272R	TRANSISTOR 2SA1037K-R
Q3305	CA11262R	TRANSISTOR DTC144EKA
Q3306	CA11272R	TRANSISTOR 2SA1037K-R
Q3307	CA11262R	TRANSISTOR DTC144EKA
Q3308	CA11262R	TRANSISTOR DTC144EKA
Q3309	CA11262R	TRANSISTOR DTC144EKA
Q3310	CA11262R	TRANSISTOR DTC144EKA
Q3311	5328974	TRANSISTOR 2SC2412K
Q3312	5328974	TRANSISTOR 2SC2412K
Q3313	CA11262R	TRANSISTOR DTC144EKA
⚠QF1201	5721941	IC PROTECTOR
⚠QF1901	5721941	IC PROTECTOR
ZD1202	5339262	DIODE HZS6-C2
ZD1601	5339478	DIODE HZS11C3
ZD1603	5339296	DIODE HZS5B2
ZD1604	5339296	DIODE HZS5B2
ZD1605	5339282	DIODE HZS6-B2
ZD1851	5339482	DIODE HZS15-2
ZD1901	5339262	DIODE HZS6-C2
ZD2851	5339254	DIODE HZS30-1
ZD2858	5339274	DIODE HZS15-3
		TRANSFORMERS
T1401	5261533	TRANSFORMER
⚠T1852	5214535	TRANSFORMER, POWER
		COILS
L0001	5159154	CHOKE COIL 100UH
L0002	5159154	CHOKE COIL 100UH
L0003	0770057	CHOKE COIL 100UH+-5%
L0004	0770057	CHOKE COIL 100UH+-5%
L0005	0770057	CHOKE COIL 100UH+-5%
L0006	0770057	CHOKE COIL 100UH+-5%
L0007	5159146	CHOKE COIL 27UH
L1401	0770057	CHOKE COIL 100UH+-5%
L1402	BH10201	COIL 33MH
L1502	5159143	COIL 15UH
L1503	5159134	COIL 3.3UH
L1601	0770057	CHOKE COIL 100UH+-5%
L1703	0770057	CHOKE COIL 100UH+-5%
⚠L1851	5220242	COIL
L3002	0770057	CHOKE COIL 100UH+-5%
L3004	0770064	CHOKE COIL 330UH+-5%
L3005	0770066	CHOKE COIL 470UH+-5%
L3006	5159151	CHOKE COIL 56UH
L3007	5159145	CHOKE COIL 22UH
L3008	0770057	CHOKE COIL 100UH+-5%
L3009	0770068	CHOKE COIL 680UH+-5%
L3201	0770057	CHOKE COIL 100UH+-5%
L3202	0770057	CHOKE COIL 100UH+-5%
L3203	0770057	CHOKE COIL 100UH+-5%
L3204	5159147	CHOKE COIL 33UH
L3205	5159134	COIL 3.3UH
L3207	0770057	CHOKE COIL 100UH+-5%
L3208	5159143	COIL 15UH
L3209	5159149	CHOKE COIL 47UH
L3211	5159148	CHOKE COIL 39UH
L3301	5159158	CHOKE COIL 220UH
L3302	0770057	CHOKE COIL 100UH+-5%

SYMBOL NO	P-NO	DESCRIPTION
L3303	0770057	CHOKE COIL 100UH+-5%
L3304	0770057	CHOKE COIL 100UH+-5%
L3307	0770057	CHOKE COIL 100UH+-5%
L3308	5159145	CHOKE COIL 22UH
L3309	5159151	CHOKE COIL 56UH
L3310	5159151	CHOKE COIL 56UH
L3311	5159149	CHOKE COIL 47UH
L3312	5159148	CHOKE COIL 39UH
L3313	5159148	CHOKE COIL 39UH
		CRYSTALS
X1701	BP10731R	CRYSTAL
X1901	BP10251	CRYSTAL
X1902	BP10501	CRYSTAL
X3201	5778874	CRYSTAL
		MISCELLANEOUS
BL1901	5272378	LC FILTER
BL1902	5272376	FILTER
BT1901	FS10611	BATTERY
BZ1901	5400072	BUZZER
CN0001	5813916	MINI CONNECTOR
CN0002	5846303	CONNECTOR
CN0003	5846952	CONNECTOR
CN0004	5846209	CONNECTOR
CN0005	5846275	CONNECTOR
CN0006	5813733	MINI CONNECTOR
CN0007	5813767	CONNECTOR
CN0008	5846211	CONNECTOR
CN0009	5813931	MINI CONNECTOR
CN0010	EF10367	CONNECTOR
CN0015	1880362	CONNECTOR
CP3202	5163805	FILTER, LOW PASS
DG1201	DD10131	DISPLAY, FLOURESCENT
DL3204	5785387	DELAY LINE
⚠FU1851	5721061	FUSE 1.6A
⚠FU1852	5720177	FUSE 2A
⚠FU1853	5720174	FUSE 630MA
PG0001	5655102	CONNECTOR
PG0002	5666569	MINI PLUG
PG0003	5666149	MINI PLUG
PG1121	5666578	PLUG
PG1122	5666591	MINI PLUG
PG1131	5655042	PLUG
PG1132	5655042	PLUG
PG1135	ED10697	PLUG
PG1201	5665631	MINI PLUG
PG1202	5665631	MINI PLUG
PG1203	5669595	CONNECTOR
PG1303	5668168	MINI PLUG
PG1401	5666609	MINI PLUG
PG1601	5666562	MINI PLUG
PG1602	5666566	PLUG
PG1603	5666567	MINI PLUG
PG1762	5666575	MINI PLUG
PG1901	5662855	PLUG
PG1902	5666145	MINI CONNECTOR
PG1903	5666151	MINI PLUG
PG1904	5665641	MINI PLUG
PG1905	5665641	MINI PLUG
PG1906	5666601	MINI PLUG
PG2101	1830141	PLUG
PG2851	5666145	MINI CONNECTOR

SYMBOL NO	P-NO	DESCRIPTION	SYMBOL NO	P-NO	DESCRIPTION
PG2852	5666151	MINI PLUG			
PG3201	5666149	MINI PLUG			
PG3202	5666569	MINI PLUG			
PG3210	5666563	MINI PLUG			
RJ1401	ER10181	JACK			
S1201	5634884	SWITCH			
S1202	5634884	SWITCH			
S1203	5634884	SWITCH			
S1204	5634884	SWITCH			
S1205	5634884	SWITCH			
S1206	5634884	SWITCH			
S1207	5634884	SWITCH			
S1208	5634884	SWITCH			
S1212	5634884	SWITCH			
S1213	5634884	SWITCH			
S1214	5634884	SWITCH			
S1215	5634884	SWITCH			
S1216	5634884	SWITCH			
S1217	5634884	SWITCH			
S1301	5634884	SWITCH			
S1302	5634884	SWITCH			
S1303	5634884	SWITCH			
S1304	5634884	SWITCH			
S1305	5634884	SWITCH			
S1306	5634884	SWITCH			
S1307	5634884	SWITCH			
S1308	5634884	SWITCH			
S1309	5634884	SWITCH			
S1310	5634884	SWITCH			
S1311	5634884	SWITCH			
S2101	5635631	SWITCH			
S2102	5635331	SWITCH			
S2104	5610891	SWITCH			

CHAPTER 7 SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS/ MICROPROCESSOR PIN FUNCTION TABLES

Cautions when using schematic diagrams

Caution for safety

The parts marked ⚠ are critical for safety. Be sure to use the specified parts to ensure safety when replacing them.

1. Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations.

[Resistors]

Item	Indication
Value	No indication .... Ω K .... k Ω M .... M Ω
Tolerance	No indication .... ±5% (All tolerances other than ± 5% are indicated in the schematic diagrams)
Power capacitance	No indication .... 1/8W (1/16W for leadless resistors without indication) All capacitances other than the above are indicated in the schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication .... μF P .... pF
Dielectric strength	No indication .... 50V (All dielectric strengths other than 50V are indicated in the schematic diagrams.)

[Coils]

Item	Indication
Value	μ .... μH m .... mH

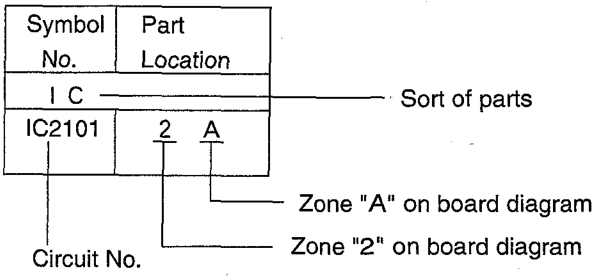
Cautions when using circuit board diagrams

1. Identifications of sides A/B in circuit board diagrams
   1) Board having a pattern on one side and parts on both sides.
      Side A: Shows discrete parts, viewed from the pattern side.
      Side B: Shows leadless parts, viewed from the pattern side.
   2) Board having patterns on both sides and parts on both sides.
      Side A: Shows parts and patterns which can be seen when the case is opened.
      Side B: Shows parts and the pattern on the back of side A.

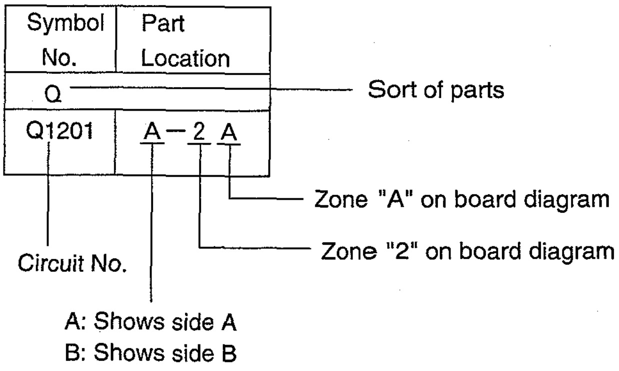
2. Table for indexing locations of parts

This table shows locations of each part on the circuit board diagrams. The locations are indicated using the guide scales on the external lines of diagrams.

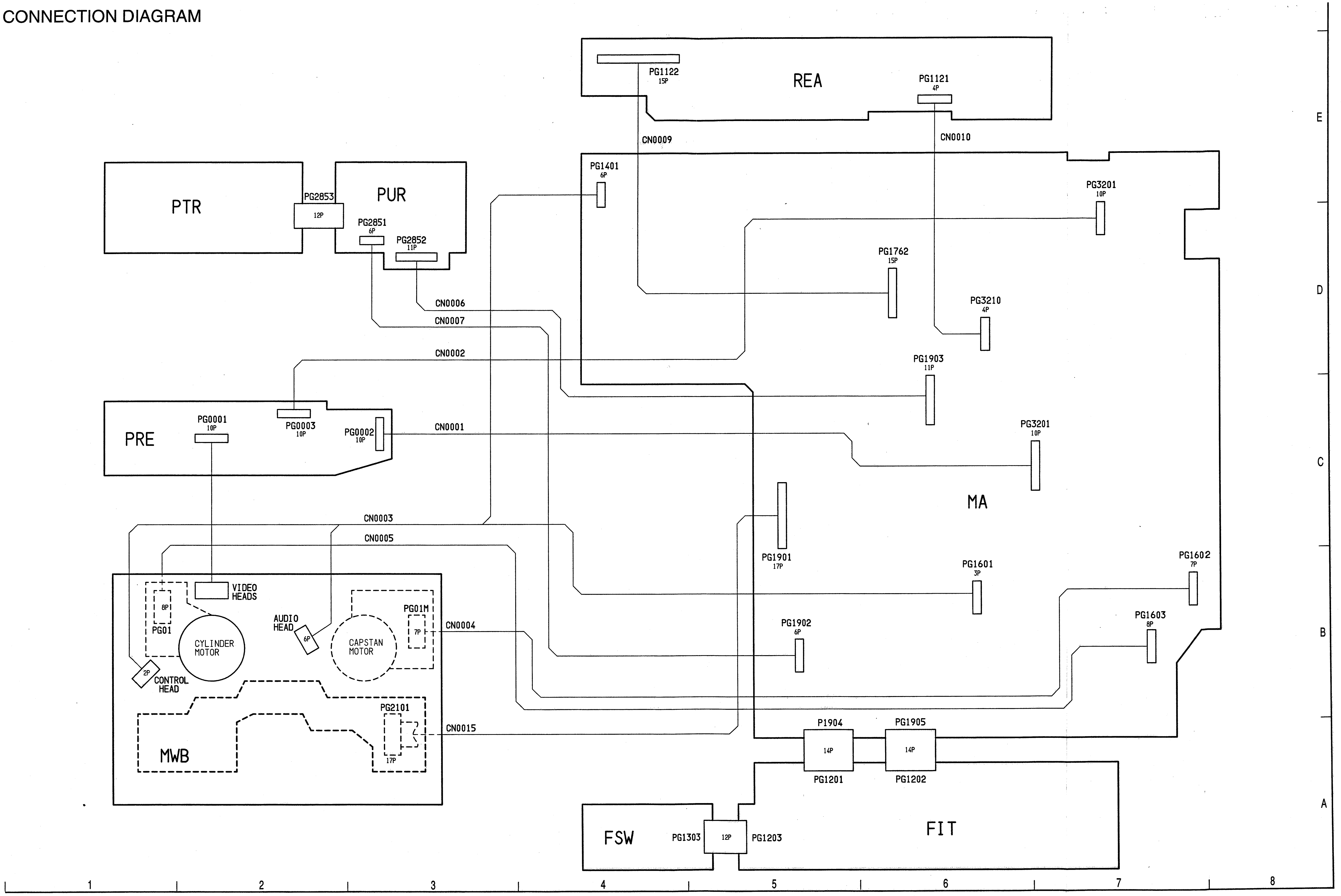
1) In case of one-layer board


Symbol No.
Part Location
I C
Sort of parts
IC2101
2 A
Zone "A" on board diagram
Zone "2" on board diagram
Circuit No.

2) In case of side A/B indication board

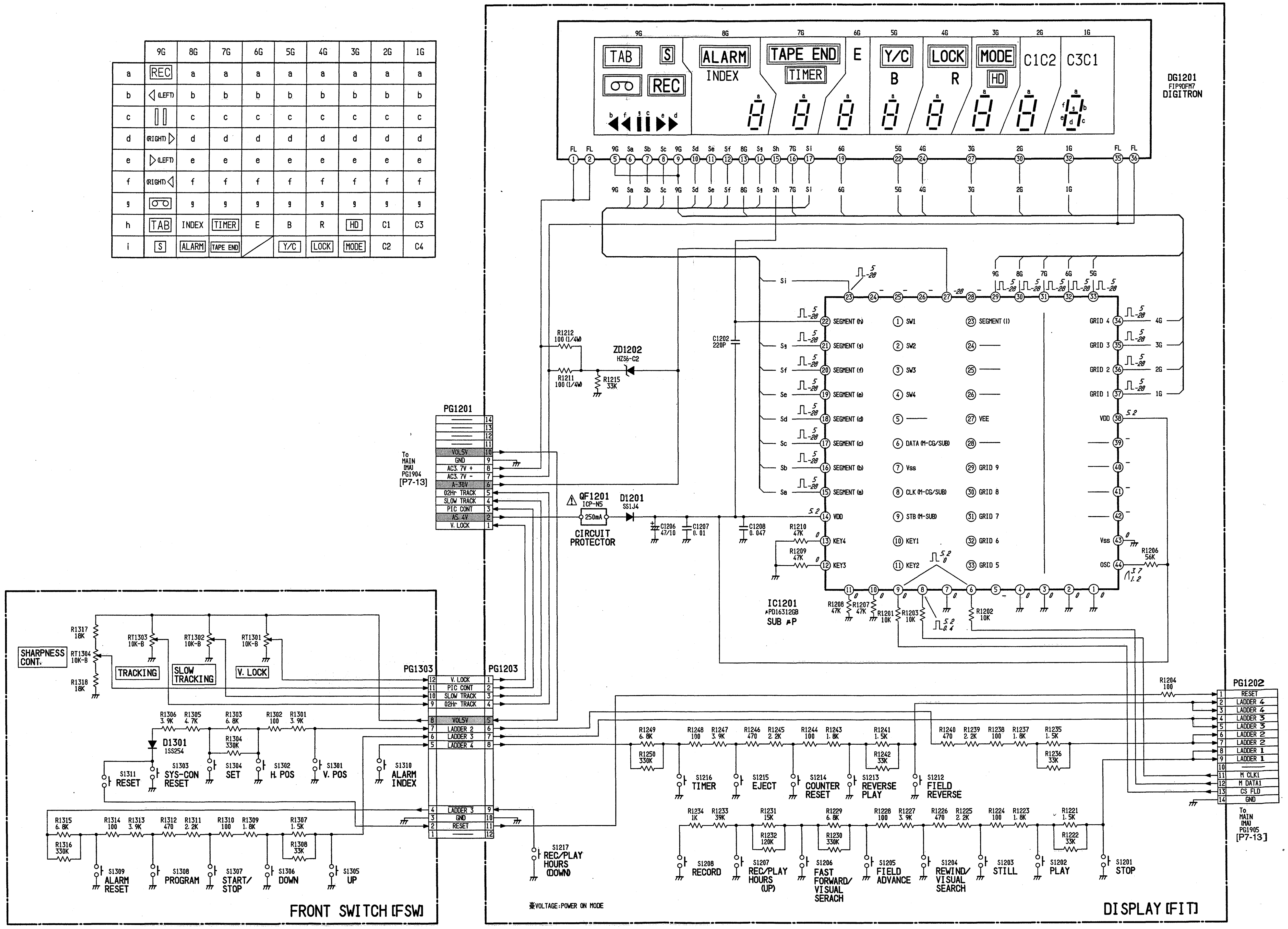

Symbol No.
Part Location
Q
Sort of parts
Q1201
A－2 A
Zone "A" on board diagram
Zone "2" on board diagram
Circuit No.
A: Shows side A
B: Shows side B

CONNECTION DIAGRAM


REA
PG1122
15P
PG1121
4P
CN0009
CN0010
PTR
PUR
PG2853
12P
PG2851
6P
PG2852
11P
PG1401
6P
PG3201
10P
PG1762
15P
PG3210
4P
CN0006
CN0007
CN0002
PG1903
11P
PRE
PG0001
10P
PG0003
10P
PG0002
10P
CN0001
PG3201
10P
MA
CN0003
CN0005
PG1901
17P
PG1601
3P
PG1602
7P
VIDEO
HEADS
8P
PG01
CYLINDER
MOTOR
AUDIO
HEAD
6P
CAPSTAN
MOTOR
PG01M
7P
CN0004
PG1902
6P
PG1603
8P
2P
CONTROL
HEAD
PG2101
17P
CN0015
MWB
P1904
14P
PG1905
14P
PG1201
PG1202
FSW
PG1303
12P
PG1203
FIT
E
D
C
B
A
1
2
3
4
5
6
7
8

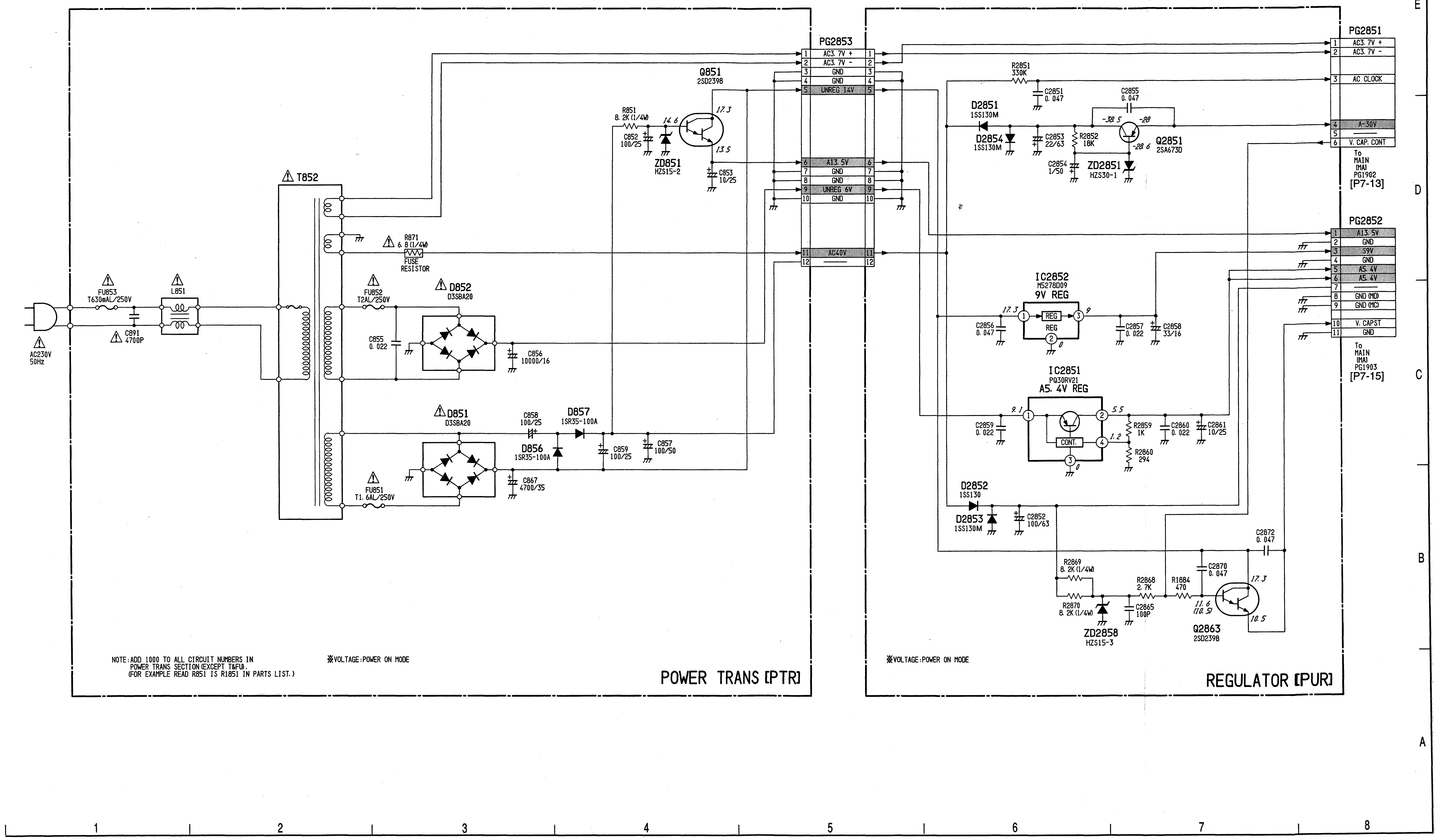
DISPLAY [FIT], FRONT SWITCH [FSW] SCHEMATIC DIAGRAM

	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	REC	a	a	a	a	a	a	a	a
b	◁ (LEFT)	b	b	b	b	b	b	b	b
c	▯▯	c	c	c	c	c	c	c	c
d	(RIGHT) ▷	d	d	d	d	d	d	d	d
e	▷ (LEFT)	e	e	e	e	e	e	e	e
f	(RIGHT) ◁	f	f	f	f	f	f	f	f
g	⊙⊙	g	g	g	g	g	g	g	g
h	TAB	INDEX	TIMER	E	B	R	HD	C1	C3
i	S	ALARM	TAPE END	/	Y/C	LOCK	MODE	C2	C4


DG1201
FIP9FM7
DIGITRON
TAB
S
ALARM
INDEX
TAPE END
TIMER
REC
E
Y/C
B
LOCK
R
MODE
HD
C1C2
C3C1
PG1201
To MAIN [MA] PG1904 [P7-13]
VOL5V
GND
AC3.7V +
AC3.7V -
A-30V
02Hr TRACK
SLOW TRACK
PIC CONT
A5.4V
V. LOCK
R1212 100 (1/4W)
R1211 100 (1/4W)
R1215 33K
ZD1202 HZS6-C2
QF1201 ICP-N5
250mA
CIRCUIT PROTECTOR
D1201 SS1J4
C1206 47/10
C1207 0.01
C1202 220P
C1208 0.047
R1210 47K
R1209 47K
IC1201
μPD16312GB
SUB μP
① SW1
② SW2
③ SW3
④ SW4
⑤ —
⑥ DATA (M-CG/SUB)
⑦ Vss
⑧ CLK (M-CG/SUB)
⑨ STB (M-SUB)
⑩ KEY1
⑪ KEY2
⑫ KEY3
⑬ KEY4
⑭ VDD
⑮ SEGMENT (a)
⑯ SEGMENT (b)
⑰ SEGMENT (c)
⑱ SEGMENT (d)
⑲ SEGMENT (e)
⑳ SEGMENT (f)
㉑ SEGMENT (g)
㉒ SEGMENT (h)
㉓ SEGMENT (i)
㉗ VEE
㉙ GRID 9
㉚ GRID 8
㉛ GRID 7
㉜ GRID 6
㉝ GRID 5
GRID 4 ㉞
GRID 3 ㉟
GRID 2 ㊱
GRID 1 (37)
VDD (38)
Vss (43)
OSC (44)
R1206 56K
R1208 47K
R1207 47K
R1201 10K
R1203 10K
R1202 10K
R1204 100
PG1202
RESET
LADDER 4
LADDER 3
LADDER 2
LADDER 1
M CLK1
M DATA1
CS FLD
GND
To MAIN [MA] PG1905 [P7-13]
PG1303
PG1203
SHARPNESS CONT.
R1317 18K
RT1304 10K-B
R1318 18K
RT1303 10K-B
TRACKING
RT1302 10K-B
SLOW TRACKING
RT1301 10K-B
V. LOCK
D1301 1SS254
S1311 RESET
S1303 SYS-CON RESET
S1304 SET
S1302 H. POS
S1301 V. POS
S1310 ALARM INDEX
S1309 ALARM RESET
S1308 PROGRAM
S1307 START/STOP
S1306 DOWN
S1305 UP
FRONT SWITCH [FSW]
S1217 REC/PLAY HOURS (DOWN)
S1216 TIMER
S1215 EJECT
S1214 COUNTER RESET
S1213 REVERSE PLAY
S1212 FIELD REVERSE
S1208 RECORD
S1207 REC/PLAY HOURS (UP)
S1206 FAST FORWARD/ VISUAL SERACH
S1205 FIELD ADVANCE
S1204 REWIND/ VISUAL SEARCH
S1203 STILL
S1202 PLAY
S1201 STOP
DISPLAY [FIT]

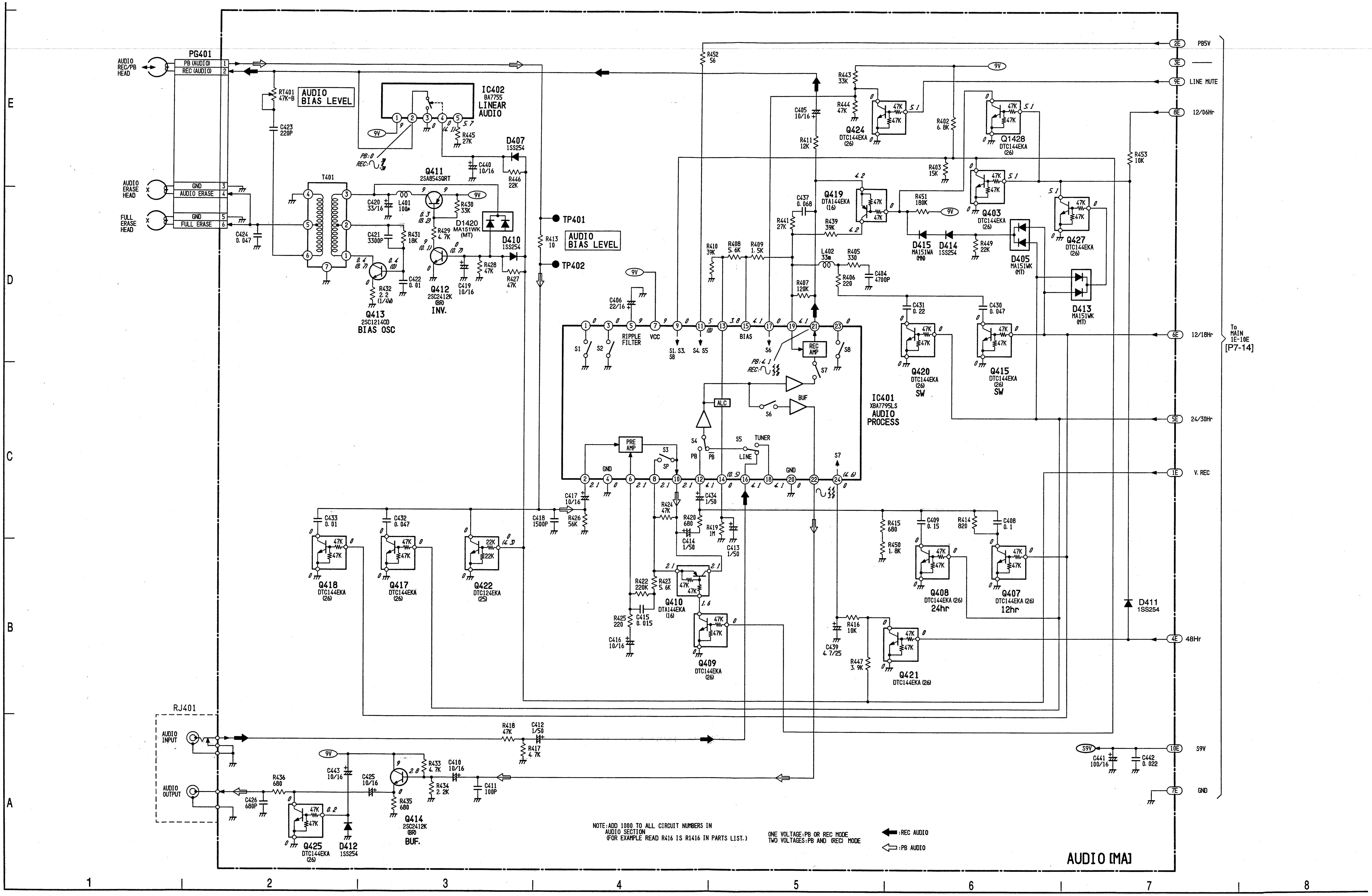
※VOLTAGE:POWER ON MODE

POWER TRANS [PTR], REGULATOR [PUR] SCHEMATIC DIAGRAM



AC230V
50Hz
FU853
T630mAL/250V
C891
4700P
L851
T852
R871
6.8(1/4W)
FUSE
RESISTOR
FU852
T2AL/250V
D852
D3SBA20
C855
0.022
C856
10000/16
D851
D3SBA20
C858
100/25
D857
1SR35-100A
D856
1SR35-100A
C859
100/25
C857
100/50
C867
4700/35
FU851
T1.6AL/250V
R851
8.2K(1/4W)
C852
100/25
ZD851
HZS15-2
14.6
Q851
2SD2398
17.3
13.5
C853
10/25
PG2853
1 AC3.7V + 1
2 AC3.7V - 2
3 GND 3
4 GND 4
5 UNREG 14V 5
6 A13.5V 6
7 GND 7
8 GND 8
9 UNREG 6V 9
10 GND 10
11 AC40V 11
12 —— 12
R2851
330K
C2851
0.047
D2851
1SS130M
D2854
1SS130M
C2853
22/63
R2852
18K
C2854
1/50
C2855
0.047
-38.5
-28
-28.6
Q2851
2SA673D
ZD2851
HZS30-1
PG2851
1 AC3.7V +
2 AC3.7V -
3 AC CLOCK
4 A-30V
5 ——
6 V.CAP.CONT
To
MAIN
[MA]
PG1902
[P7-13]
PG2852
1 A13.5V
2 GND
3 S9V
4 GND
5 A5.4V
6 A5.4V
7 ——
8 GND (MD)
9 GND (MC)
10 V.CAPST
11 GND
To
MAIN
[MA]
PG1903
[P7-15]
IC2852
M5278D09
9V REG
REG
17.3
9
0
C2856
0.047
C2857
0.022
C2858
33/16
IC2851
PQ30RV21
A5.4V REG
CONT.
9.1
5.5
1.2
0
C2859
0.022
R2859
1K
R2860
294
C2860
0.022
C2861
10/25
D2852
1SS130
D2853
1SS130M
C2852
100/63
C2872
0.047
R2869
8.2K(1/4W)
R2870
8.2K(1/4W)
ZD2858
HZS15-3
R2868
2.7K
C2865
100P
R1884
470
C2870
0.047
11.6
(10.5)
17.3
10.5
Q2863
2SD2398
NOTE:ADD 1000 TO ALL CIRCUIT NUMBERS IN
POWER TRANS SECTION(EXCEPT T&FU).
(FOR EXAMPLE READ R851 IS R1851 IN PARTS LIST.)
※VOLTAGE:POWER ON MODE
POWER TRANS [PTR]
※VOLTAGE:POWER ON MODE
REGULATOR [PUR]
E
D
C
B
A
1
2
3
4
5
6
7
8

AUDIO [MA] SCHEMATIC DIAGRAM


PG401
PB (AUDIO)
REC (AUDIO)
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
GND
AUDIO ERASE
FULL ERASE
RT401 47K-B
AUDIO BIAS LEVEL
C423 220P
C424 0.047
T401
IC402 BA7755 LINEAR AUDIO
9V
PB:0
REC:
R445 27K
D407 1SS254
C440 10/16
R446 22K
Q411 2SA854SQRT
C420 33/16
L401 100μ
R430 33K
C421 3300P
R431 18K
R429 4.7K
D1420 MA151WK (MT)
D410 1SS254
R428 47K
R427 47K
C419 10/16
Q412 2SC2412K (BR) INV.
C422 0.01
R432 2.2 (1/4W)
Q413 2SC1214CD BIAS OSC
TP401
TP402
R413 10
AUDIO BIAS LEVEL
R452 56
R443 33K
C405 10/16
R411 12K
R444 47K
Q424 DTC144EKA (26)
R402 6.8K
Q1428 DTC144EKA (26)
R403 15K
R453 10K
Q419 DTA144EKA (16)
C437 0.068
R441 27K
R439 39K
R451 180K
Q403 DTC144EKA (26)
Q427 DTC144EKA (26)
D415 MA151WA (MN)
D414 1SS254
R449 22K
D405 MA151WK (MT)
D413 MA151WK (MT)
R410 39K
R408 5.6K
R409 1.5K
L402 33m
R405 330
R406 220
C404 4700P
R407 120K
C406 22/16
C431 0.22
C430 0.047
RIPPLE FILTER
VCC
BIAS
S1 S2 S1.S3. S8 S4.S5 S6 S7 S8
REC AMP
BUF
ALC
PRE AMP
SP
PB
TUNER
LINE
GND
IC401 XBA7795LS AUDIO PROCESS
Q420 DTC144EKA (26) SW
Q415 DTC144EKA (26) SW
C417 10/16
C418 1500P
R426 56K
R424 47K
R420 680
C434 1/50
C414 1/50
R419 1M
C413 1/50
R422 220K
R423 5.6K
Q410 DTA144EKA (16)
R425 220
C415 0.015
C416 10/16
Q409 DTC144EKA (26)
C433 0.01
C432 0.047
Q418 DTC144EKA (26)
Q417 DTC144EKA (26)
Q422 DTC124EKA (25)
R415 680
R450 1.8K
C409 0.15
R414 820
C408 0.1
Q408 DTC144EKA (26) 24hr
Q407 DTC144EKA (26) 12hr
D411 1SS254
C439 4.7/25
R416 10K
R447 3.9K
Q421 DTC144EKA (26)
RJ401
AUDIO INPUT
AUDIO OUTPUT
R418 47K
C412 1/50
R417 4.7K
R436 680
C426 680P
C443 10/16
C425 10/16
R433 4.7K
C410 10/16
R434 2.2K
C411 100P
R435 680
Q414 2SC2412K (BR) BUF.
Q425 DTC144EKA (26)
D412 1SS254
C441 100/16
C442 0.022
PB5V
LINE MUTE
12/06Hr
12/18Hr
24/30Hr
V.REC
48Hr
S9V
GND
To MAIN 1E-10E [P7-14]
AUDIO [MA]
E D C B A
1 2 3 4 5 6 7 8

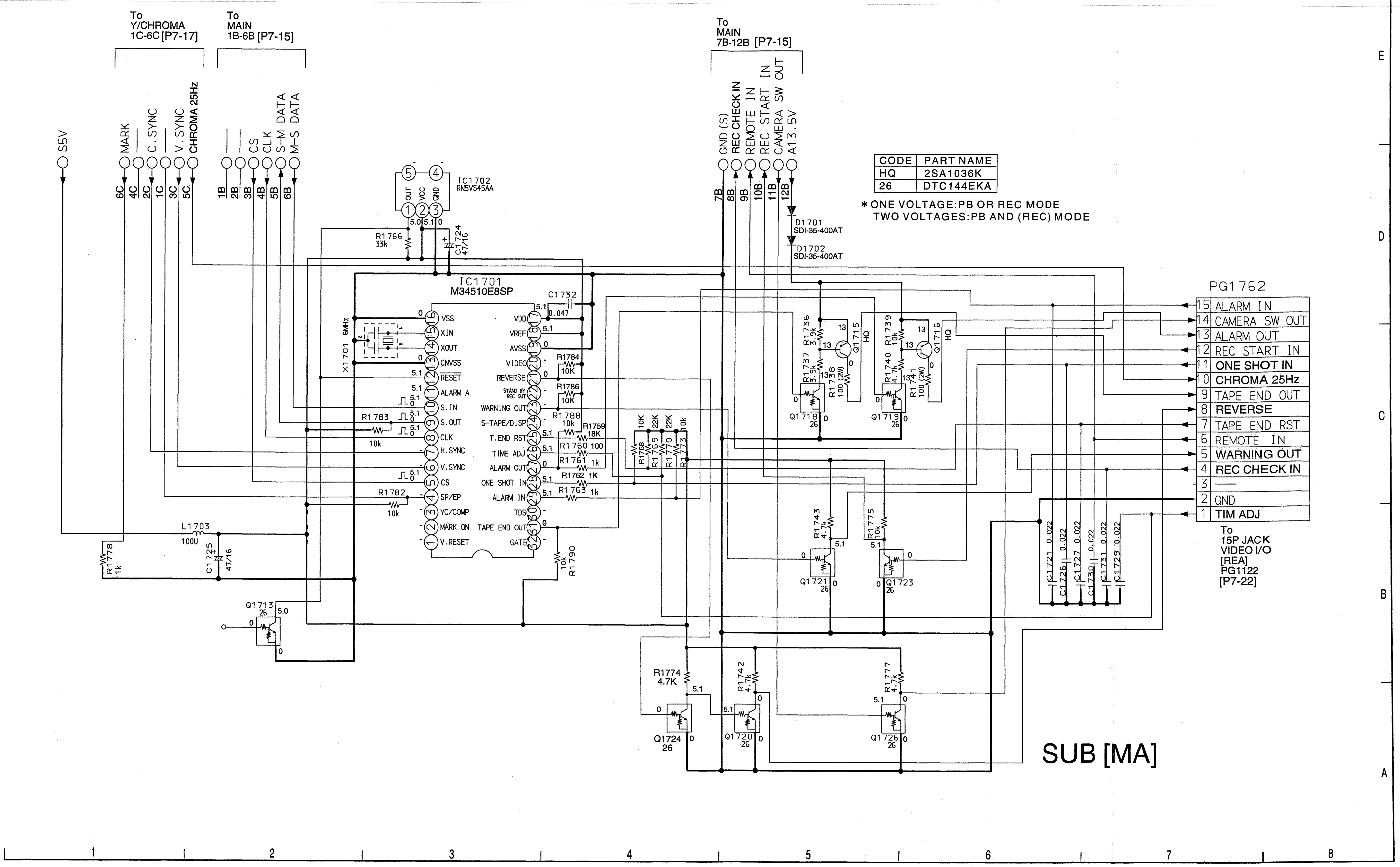
NOTE: ADD 1000 TO ALL CIRCUIT NUMBERS IN AUDIO SECTION
(FOR EXAMPLE READ R416 IS R1416 IN PARTS LIST.)

ONE VOLTAGE: PB OR REC MODE
TWO VOLTAGES: PB AND (REC) MODE

⬅ : REC AUDIO

⇦ : PB AUDIO

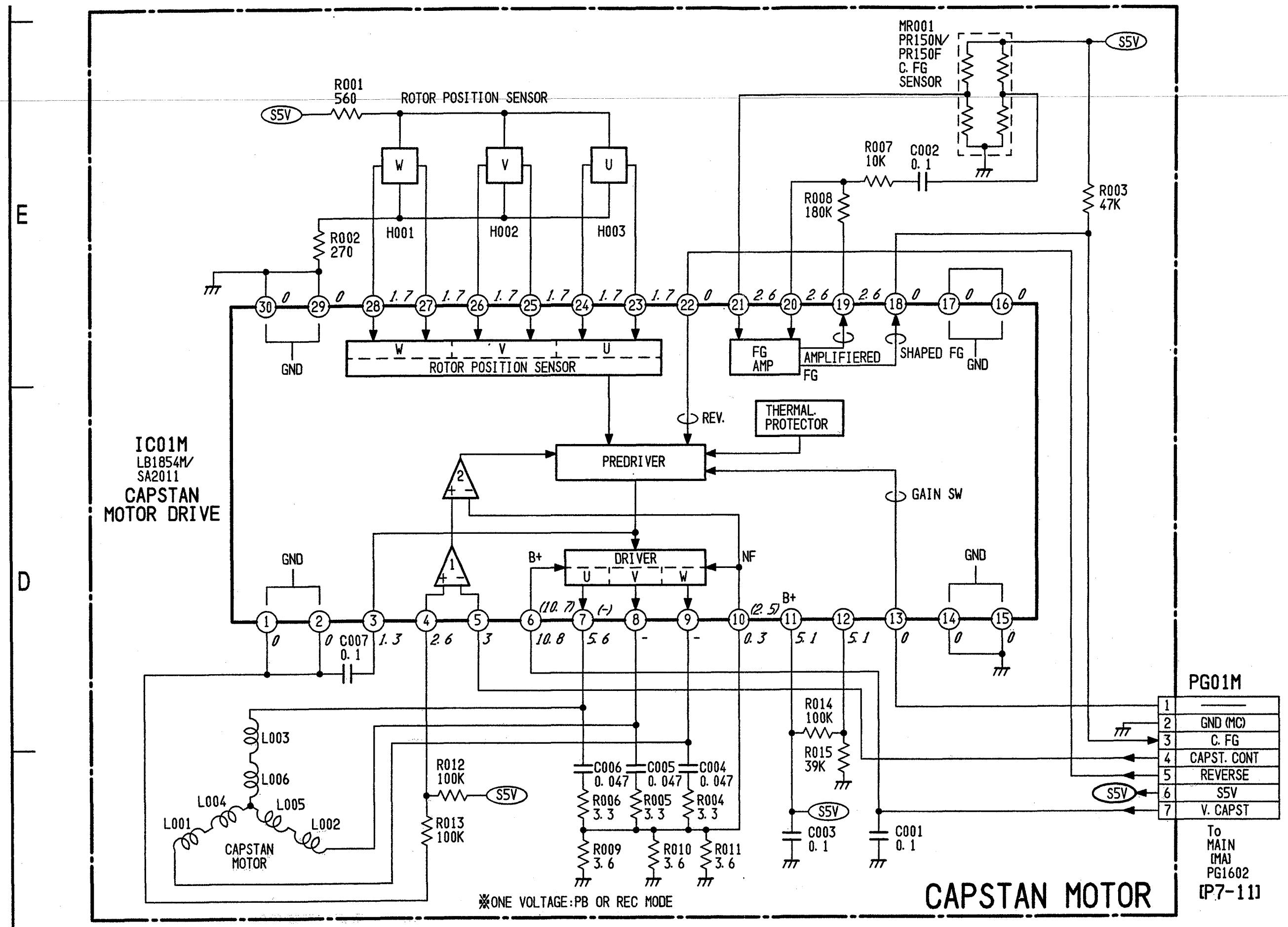
SUB [MA] SCHEMATIC DIAGRAM


To
Y/CHROMA
1C-6C [P7-17]
To
MAIN
1B-6B [P7-15]
To
MAIN
7B-12B [P7-15]
S5V
MARK
C. SYNC
V. SYNC
CHROMA 25Hz
CS
CLK
S-M DATA
M-S DATA
6C
4C
2C
1C
3C
5C
1B
2B
3B
4B
5B
6B
GND (S)
REC CHECK IN
REMOTE IN
REC START IN
CAMERA SW OUT
A13.5V
7B
8B
9B
10B
11B
12B
IC1702
RN5VS45AA
OUT
VCC
GND
R1766
33k
C1724
47/16
IC1701
M34510E8SP
C1732
0.047
X1701 6MHz
VSS
XIN
XOUT
CNVSS
RESET
ALARM A
S.IN
S.OUT
CLK
H.SYNC
V.SYNC
CS
SP/EP
YC/COMP
MARK ON
V.RESET
VDD
VREF
AVSS
VIDEO
REVERSE
STAND BY REC OUT
WARNING OUT
S-TAPE/DISP
T.END RST
TIME ADJ
ALARM OUT
ONE SHOT IN
ALARM IN
TDS
TAPE END OUT
GATE
R1783
10k
R1782
10k
R1784
10K
R1786
10K
R1788
10k
R1759
18K
R1760
100
R1761
1k
R1762
1K
R1763
1k
R1790
10k
R1768
10K
R1769
22K
R1770
22K
R1773
10k
L1703
100U
C1725
47/16
R1778
1k
Q1713
26
D1701
SDI-35-400AT
D1702
SDI-35-400AT
R1736
3.9k
R1737
3.9k
R1738
100 (2W)
Q1715
HQ
Q1718
26
R1739
10k
R1740
4.7k
R1741
100 (2W)
Q1716
HQ
Q1719
26
R1743
4.7k
R1775
10k
Q1721
26
Q1723
26
R1774
4.7K
Q1724
26
R1742
4.7k
Q1720
26
R1777
4.7k
Q1726
26
C1721 0.022
C1726 0.022
C1727 0.022
C1730 0.022
C1731 0.022
C1729 0.022
PG1762
15 ALARM IN
14 CAMERA SW OUT
13 ALARM OUT
12 REC START IN
11 ONE SHOT IN
10 CHROMA 25Hz
9 TAPE END OUT
8 REVERSE
7 TAPE END RST
6 REMOTE IN
5 WARNING OUT
4 REC CHECK IN
3 —
2 GND
1 TIM ADJ
To
15P JACK
VIDEO I/O
[REA]
PG1122
[P7-22]
SUB [MA]
E
D
C
B
A
1
2
3
4
5
6
7
8

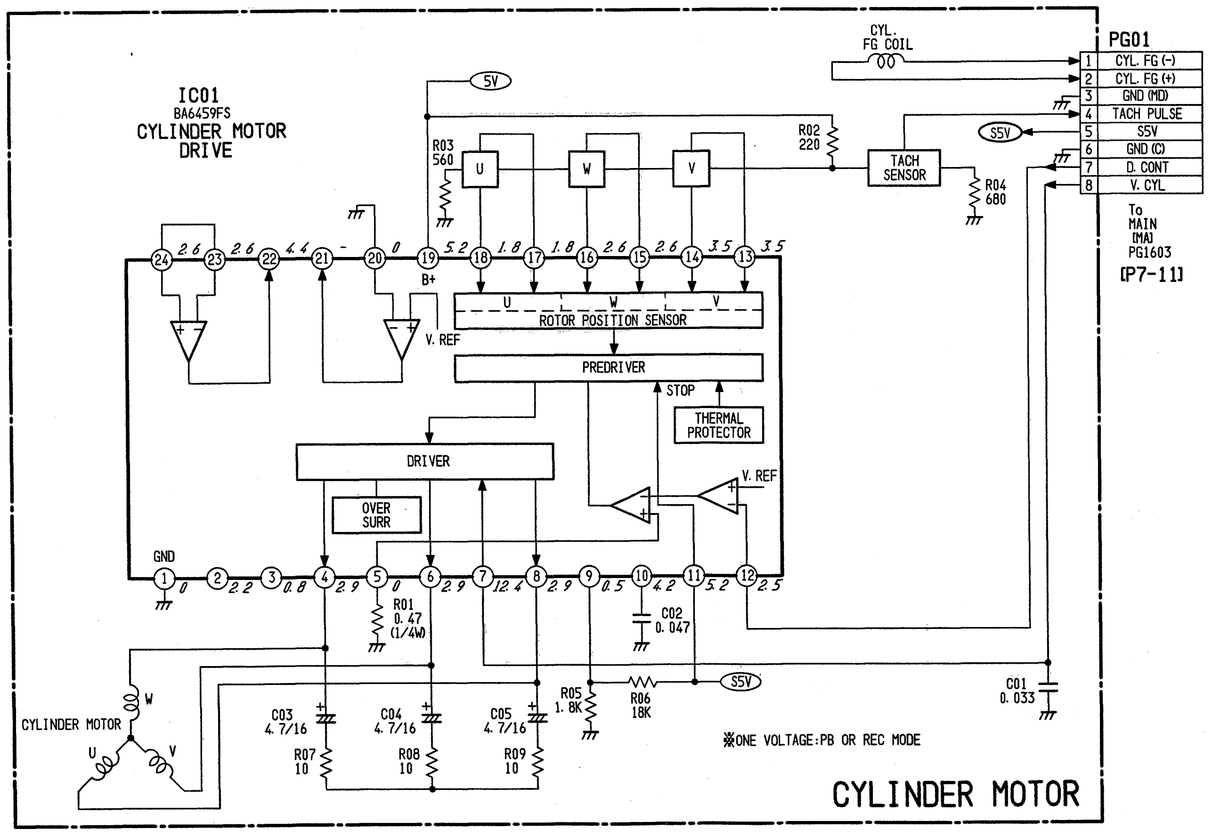
CODE	PART NAME
HQ	2SA1036K
26	DTC144EKA

* ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

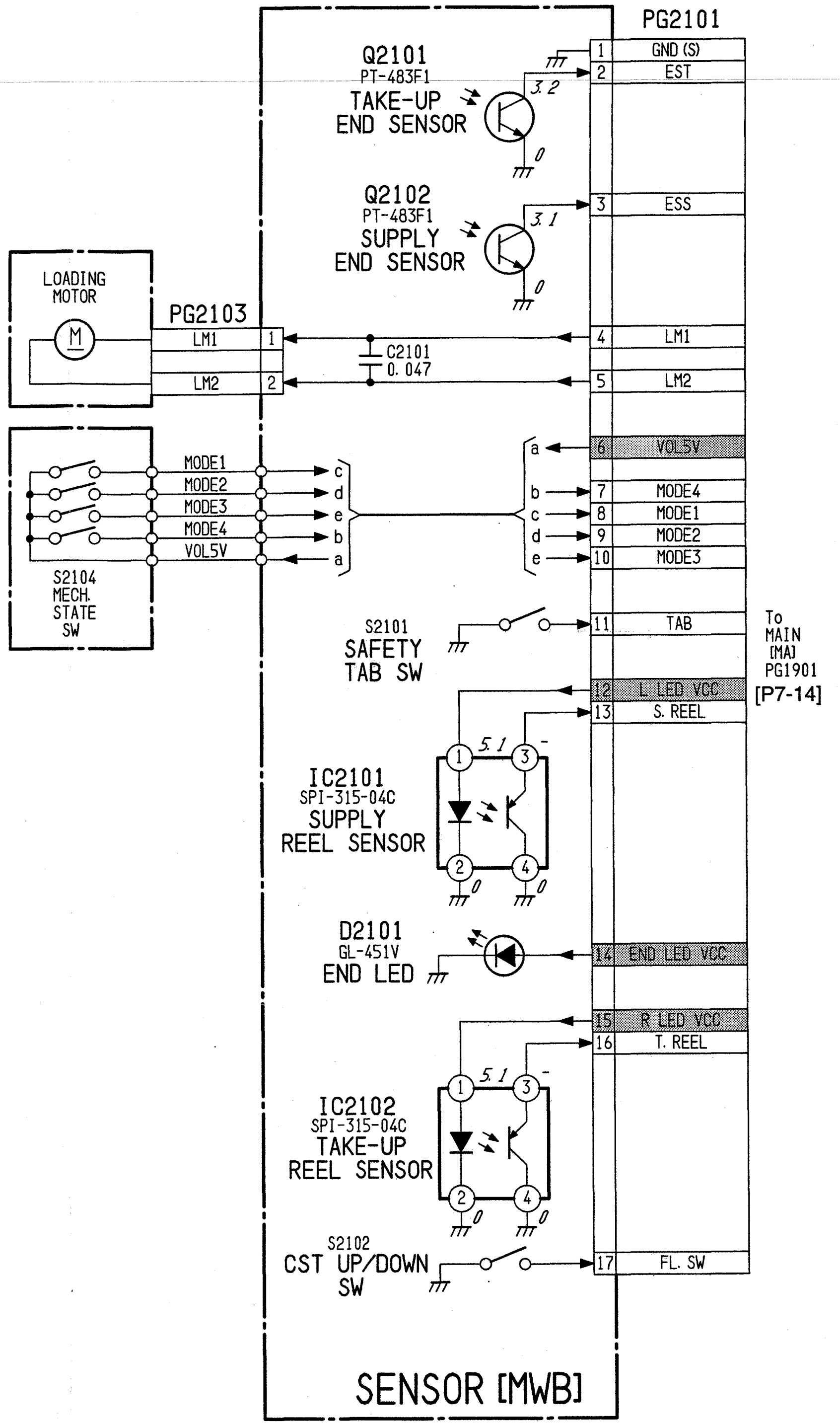
CAPSTAN MOTOR SCHEMATIC DIAGRAM


MR001
PR150N/
PR150F
C. FG
SENSOR
S5V
R001
560
ROTOR POSITION SENSOR
H001
H002
H003
R002
270
R007
10K
C002
0.1
R008
180K
R003
47K
GND
ROTOR POSITION SENSOR
FG AMP
AMPLIFIERED FG
SHAPED FG
REV.
THERMAL PROTECTOR
PREDRIVER
GAIN SW
IC01M
LB1854M/
SA2011
CAPSTAN
MOTOR DRIVE
DRIVER
B+
NF
C007
0.1
L003
L006
L004
L005
L001
L002
CAPSTAN
MOTOR
R012
100K
R013
100K
C006
0.047
C005
0.047
C004
0.047
R006
3.3
R005
3.3
R004
3.3
R009
3.6
R010
3.6
R011
3.6
R014
100K
R015
39K
C003
0.1
C001
0.1
PG01M
1 —
2 GND (MC)
3 C. FG
4 CAPST. CONT
5 REVERSE
6 S5V
7 V. CAPST
To
MAIN
(MA)
PG1602
[P7-11]
※ONE VOLTAGE:PB OR REC MODE
CAPSTAN MOTOR

CYLINDER MOTOR SCHEMATIC DIAGRAM

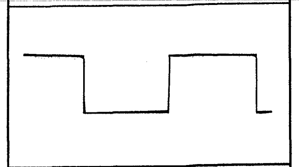

CYL.
FG COIL
PG01
1 CYL. FG (-)
2 CYL. FG (+)
3 GND (MD)
4 TACH PULSE
5 S5V
6 GND (C)
7 D. CONT
8 V. CYL
To
MAIN
(MA)
PG1603
[P7-11]
IC01
BA6459FS
CYLINDER MOTOR
DRIVE
5V
S5V
R03
560
R02
220
TACH
SENSOR
R04
680
V. REF
ROTOR POSITION SENSOR
PREDRIVER
STOP
THERMAL
PROTECTOR
DRIVER
OVER
SURR
V. REF
GND
R01
0.47
(1/4W)
C02
0.047
R05
1.8K
R06
18K
C01
0.033
CYLINDER MOTOR
C03
4.7/16
C04
4.7/16
C05
4.7/16
R07
10
R08
10
R09
10
※ONE VOLTAGE:PB OR REC MODE
CYLINDER MOTOR

SENSOR [MWB] SCHEMATIC DIAGRAM

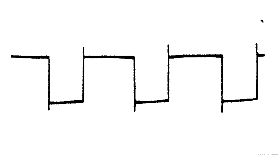

PG2101
1 GND (S)
2 EST
3 ESS
4 LM1
5 LM2
6 VOL5V
7 MODE4
8 MODE1
9 MODE2
10 MODE3
11 TAB
12 L LED VCC
13 S. REEL
14 END LED VCC
15 R LED VCC
16 T. REEL
17 FL. SW
Q2101
PT-483F1
TAKE-UP
END SENSOR
Q2102
PT-483F1
SUPPLY
END SENSOR
LOADING
MOTOR
PG2103
LM1
LM2
C2101
0.047
MODE1
MODE2
MODE3
MODE4
VOL5V
S2104
MECH.
STATE
SW
S2101
SAFETY
TAB SW
To
MAIN
(MA)
PG1901
[P7-14]
IC2101
SPI-315-04C
SUPPLY
REEL SENSOR
D2101
GL-451V
END LED
IC2102
SPI-315-04C
TAKE-UP
REEL SENSOR
S2102
CST UP/DOWN
SW
SENSOR [MWB]

SERVO WAVEFORMS

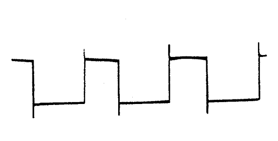
1-A IC901-24 5.6Vp-p
2V/5.0msec.cm
REC/PLAY



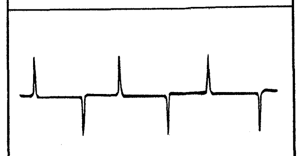
2-A IC901-31 5.7Vp-p
2V/10.0msec.cm
REC



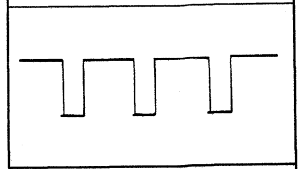
3-A IC901-31 5.7Vp-p
2V/10.0msec.cm
REC



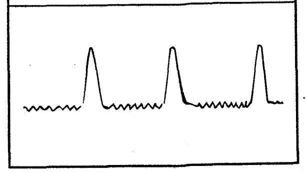
4-B IC901-37 3.0Vp-p
1V/10.0msec.cm
PLAY



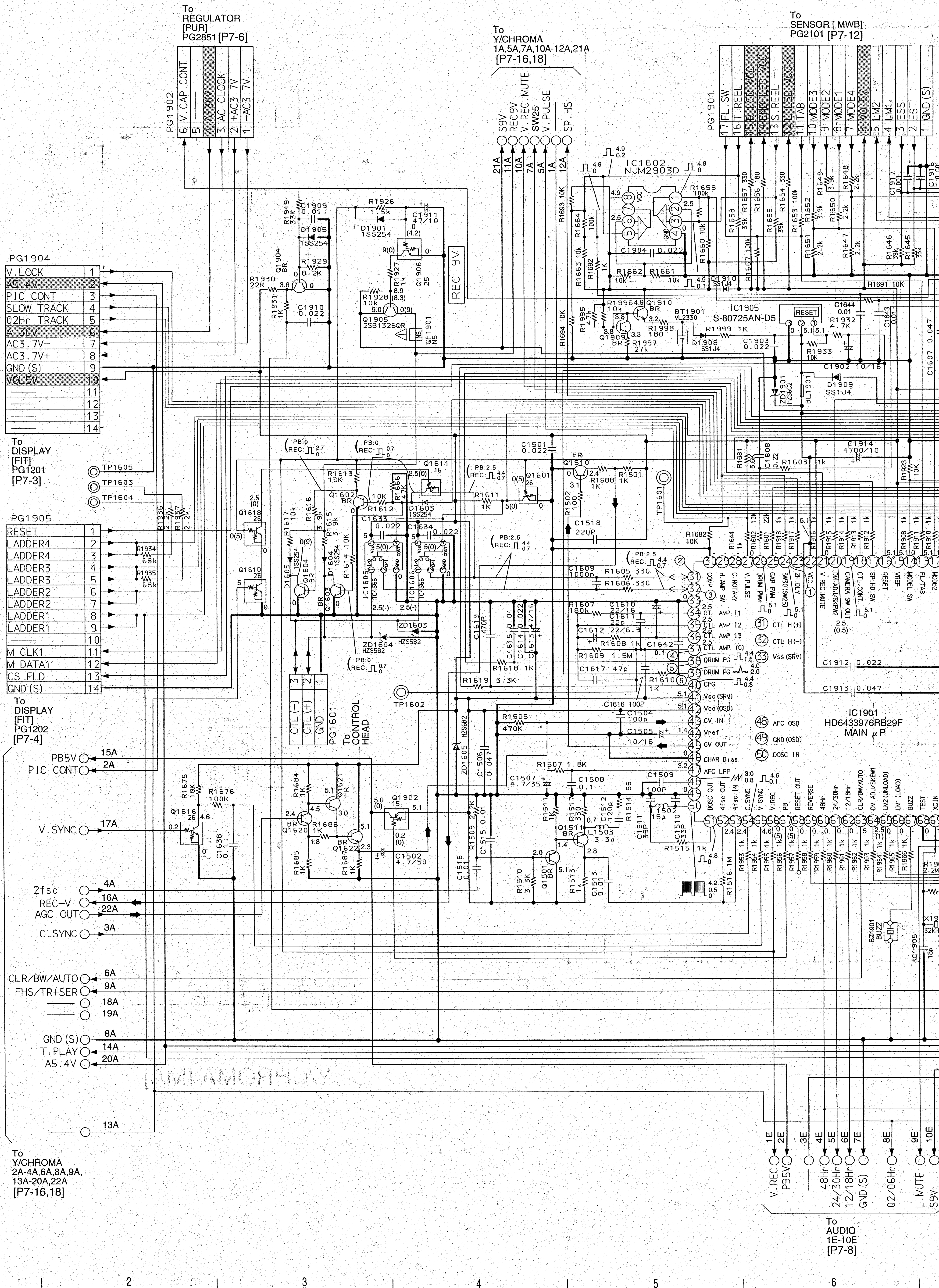
5-A IC901-38 2.8Vp-p
2V/500µsec.cm
REC/PLAY



6-A IC901-39 2.0Vp-p
2V/10.0msec.cm
REC/PLAY

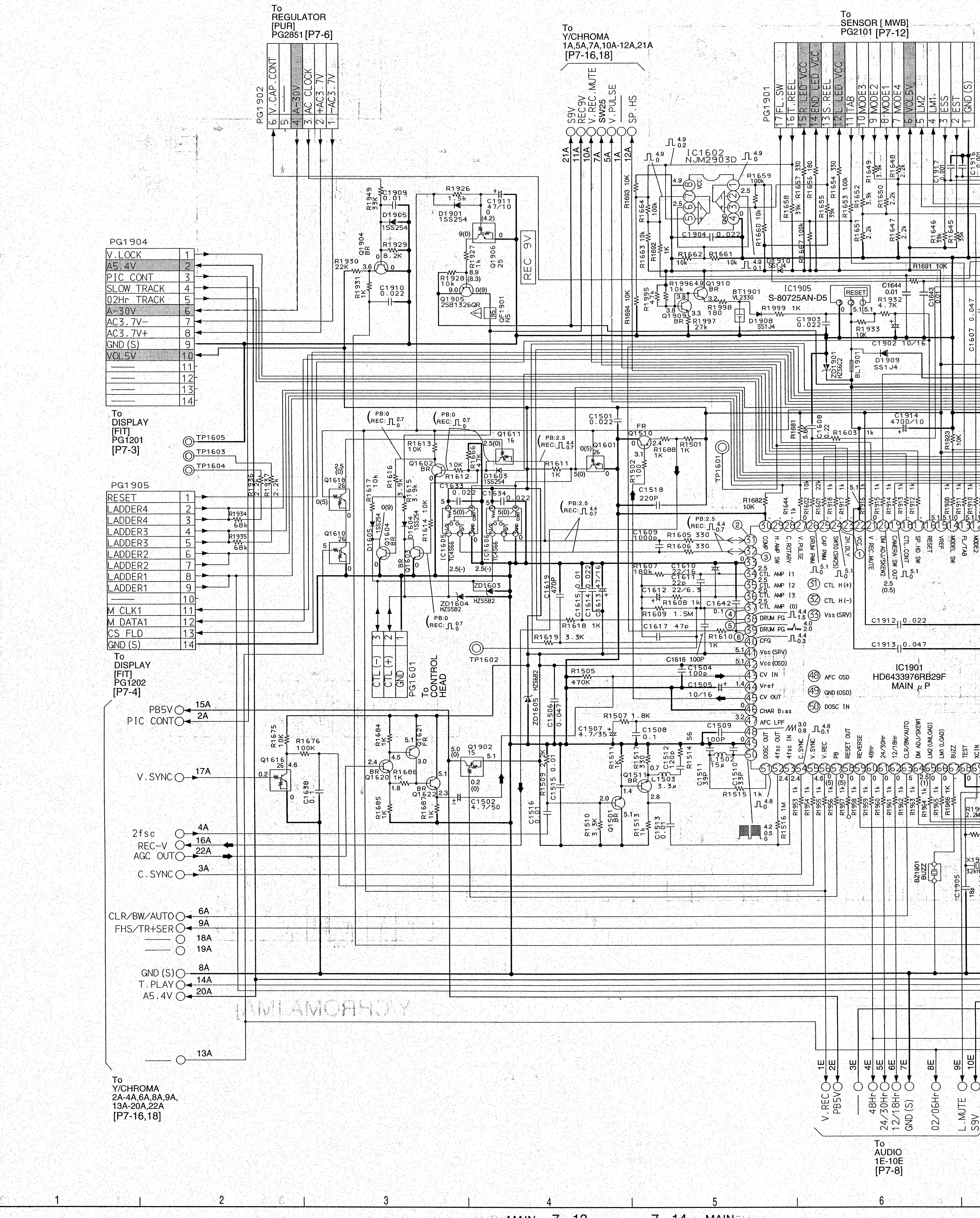


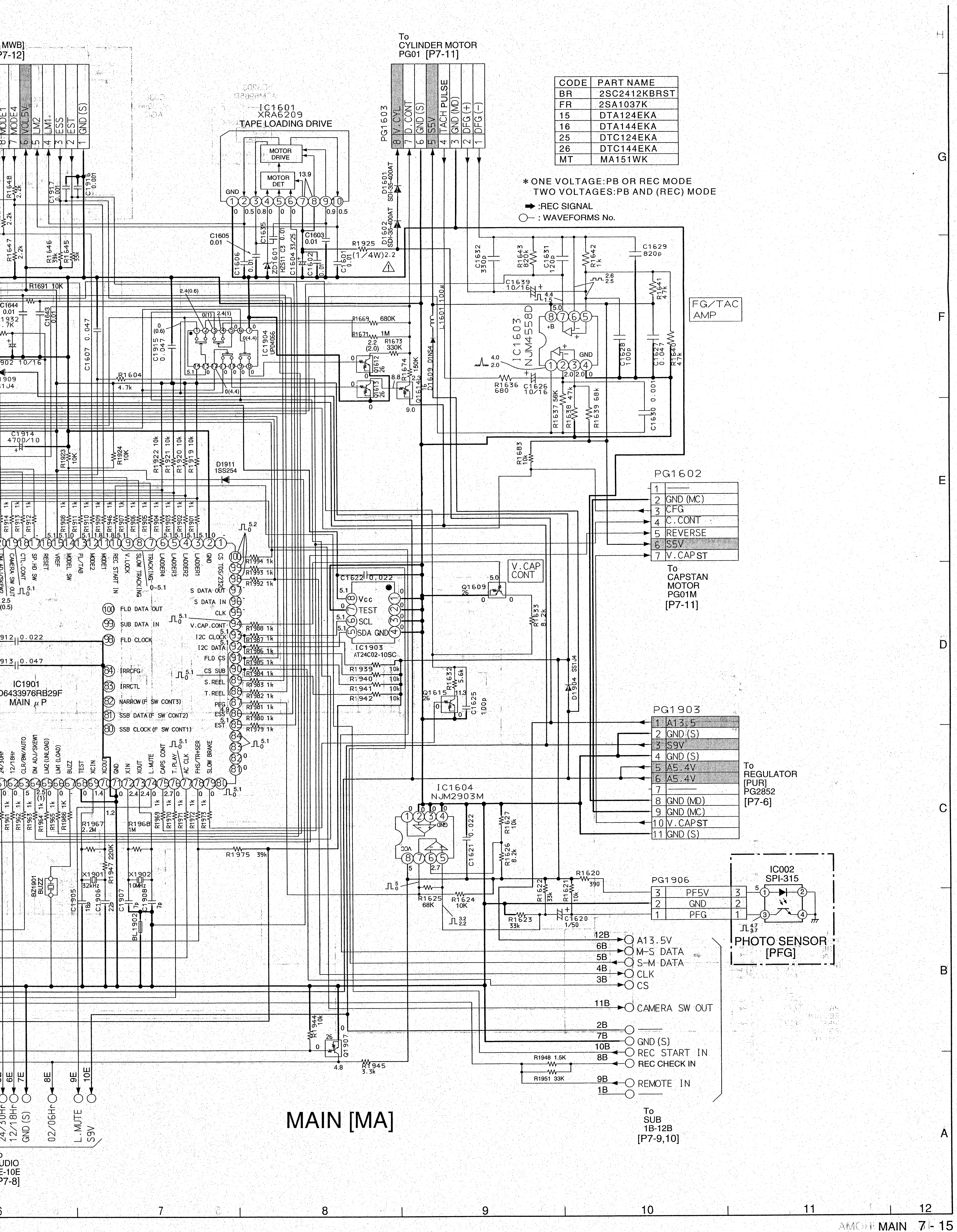
MAIN [MA] SCHEMATIC DIAGRAM



To
REGULATOR
[PUR]
PG2851 [P7-6]
PG1902
6 V.CAP.CONT
5 ——
4 A-30V
3 AC CLOCK
2 +AC3.7V
1 -AC3.7V
To
Y/CHROMA
1A,5A,7A,10A-12A,21A
[P7-16,18]
21A S9V
11A REC9V
10A V.REC.MUTE
7A SW25
5A V.PULSE
1A ——
12A SP.HS
To
SENSOR [MWB]
PG2101 [P7-12]
PG1901
17 FL.SW
16 T.REEL
15 R LED VCC
14 END LED VCC
13 S.REEL
12 L LED VCC
11 TAB
10 MODE3
9 MODE2
8 MODE1
7 MODE4
6 VOL5V
5 LM2
4 LM1
3 ESS
2 EST
1 GND (S)
PG1904
1 V.LOCK
2 A5.4V
3 PIC CONT
4 SLOW TRACK
5 02Hr TRACK
6 A-30V
7 AC3.7V-
8 AC3.7V+
9 GND (S)
10 VOL5V
To
DISPLAY
[FIT]
PG1201
[P7-3]
TP1605
TP1603
TP1604
PG1905
1 RESET
2 LADDER4
3 LADDER4
4 LADDER3
5 LADDER3
6 LADDER2
7 LADDER2
8 LADDER1
9 LADDER1
11 M CLK1
12 M DATA1
13 CS FLD
14 GND (S)
To
DISPLAY
[FIT]
PG1202
[P7-4]
15A PB5V
2A PIC CONT
17A V.SYNC
4A 2fsc
16A REC-V
22A AGC OUT
3A C.SYNC
6A CLR/BW/AUTO
9A FHS/TR+SER
18A
19A
8A GND (S)
14A T.PLAY
20A A5.4V
13A
To
Y/CHROMA
2A-4A,6A,8A,9A,
13A-20A,22A
[P7-16,18]
PG1601
3 CTL (-)
2 CTL (+)
1 GND
To
CONTROL
HEAD
TP1602
TP1601
REC 9V
IC1602
NJM2903D
IC1905
S-80725AN-D5
RESET
IC1901
HD6433976RB29F
MAIN μP
BZ1901
BUZZ
1E V.REC
2E PB5V
3E ——
4E 48Hr
5E 24/30Hr
6E 12/18Hr
7E GND (S)
8E 02/06Hr
9E L.MUTE
10E S9V
To
AUDIO
1E-10E
[P7-8]
1
2
3
4
5
6

MAIN [MA] SCHEMATIC DIAGRAM


To REGULATOR [PUR] PG2851 [P7-6]
PG1902
6 V.CAP.CONT
5
4 A-30V
3 AC CLOCK
2 +AC3.7V
1 -AC3.7V
To Y/CHROMA 1A,5A,7A,10A-12A,21A [P7-16,18]
21A S9V
11A REC9V
10A V.REC.MUTE
7A SW25
5A V.PULSE
1A
12A SP.HS
To SENSOR [MWB] PG2101 [P7-12]
PG1901
17 FL.SW
16 T.REEL
15 R LED VCC
14 END LED VCC
13 S.REEL
12 L LED VCC
11 TAB
10 MODE3
9 MODE2
8 MODE1
7 MODE4
6 VOL5V
5 LM2
4 LM1
3 ESS
2 EST
1 GND (S)
PG1904
1 V.LOCK
2 A5.4V
3 PIC CONT
4 SLOW TRACK
5 02Hr TRACK
6 A-30V
7 AC3.7V-
8 AC3.7V+
9 GND (S)
10 VOL5V
To DISPLAY [FIT] PG1201 [P7-3]
TP1605
TP1603
TP1604
PG1905
1 RESET
2 LADDER4
3 LADDER4
4 LADDER3
5 LADDER3
6 LADDER2
7 LADDER2
8 LADDER1
9 LADDER1
11 M CLK1
12 M DATA1
13 CS FLD
14 GND (S)
To DISPLAY [FIT] PG1202 [P7-4]
PB5V 15A
PIC CONT 2A
V.SYNC 17A
2fsc 4A
REC-V 16A
AGC OUT 22A
C.SYNC 3A
CLR/BW/AUTO 6A
FHS/TR+SER 9A
18A
19A
GND (S) 8A
T.PLAY 14A
A5.4V 20A
13A
To Y/CHROMA 2A-4A,6A,8A,9A, 13A-20A,22A [P7-16,18]
PG1601
3 CTL (-)
2 CTL (+)
1 GND
To CONTROL HEAD
TP1602
TP1601
REC 9V
IC1602 NJM2903D
IC1905 S-80725AN-D5
RESET
IC1605 TC4S66
IC1606 TC4S66
IC1901 HD6433976RB29F MAIN μP
BZ1901 BUZZ
V.REC 1E
PB5V 2E
3E
48Hr 4E
24/30Hr 5E
12/18Hr 6E
GND (S) 7E
02/06Hr 8E
L.MUTE 9E
S9V 10E
To AUDIO 1E-10E [P7-8]
1
2
3
4
5
6


MAIN [MA]
IC1601
XRA6209
TAPE LOADING DRIVE
MOTOR DRIVE
MOTOR DET
To
CYLINDER MOTOR
PG01 [P7-11]
PG1603
8 V.CYL
7 D.CONT
6 GND (S)
5 S5V
4 TACH PULSE
3 GND (MD)
2 DFG (+)
1 DFG (−)
D1501 SDI-35-400AT
D1502 SDI-35-400AT
IC1603
NJM4558D
FG/TAC AMP
IC1904
UPD4066
PG1602
1 —
2 GND (MC)
3 CFG
4 C.CONT
5 REVERSE
6 S5V
7 V.CAPST
To
CAPSTAN
MOTOR
PG01M
[P7-11]
V.CAP CONT
IC1903
AT24C02-10SC
IC1901
D6433976RB29F
MAIN μP
PG1903
1 A13.5
2 GND (S)
3 S9V
4 GND (S)
5 A5.4V
6 A5.4V
7 —
8 GND (MD)
9 GND (MC)
10 V.CAPST
11 GND (S)
To
REGULATOR
[PUR]
PG2852
[P7-6]
IC1604
NJM2903M
PG1906
3 PF5V
2 GND
1 PFG
IC002
SPI-315
PHOTO SENSOR
[PFG]
12B A13.5V
6B M-S DATA
5B S-M DATA
4B CLK
3B CS
11B CAMERA SW OUT
2B —
7B GND (S)
10B REC START IN
8B REC CHECK IN
9B REMOTE IN
1B —
To
SUB
1B-12B
[P7-9,10]
MWB]
[P7-12]
8 MODE1
7 MODE4
6 VOL5V
5 LM2
4 LM1
3 ESS
2 EST
1 GND (S)
24/30Hr
12/18Hr
GND (S)
02/06Hr
L.MUTE
S9V
7E
8E
9E
10E
AUDIO
E-10E
[P7-8]
Q1907
Q1609
Q1615
Q1612
Q1613
Q1614
D1904 SS1J4
D1911 1SS254
D1609 D1NS4
L1601 100μ
ZD1601 HZS11 C3
BZ1901 BUZZ
X1901 32kHz
X1902 10MHz
BL1902
A
B
C
D
E
F
G
H
6
7
8
9
10
11
12

CODE	PART NAME
BR	2SC2412KBRST
FR	2SA1037K
15	DTA124EKA
16	DTA144EKA
25	DTC124EKA
26	DTC144EKA
MT	MA151WK

* ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE
➡ :REC SIGNAL
○— : WAVEFORMS No.

Y/CHROMA [MA] SCHEMATC DIAGRAM

CODE	PART NAME
BR	2SC2412KBRST
FR	2SA1037K
26	DTC144EKA

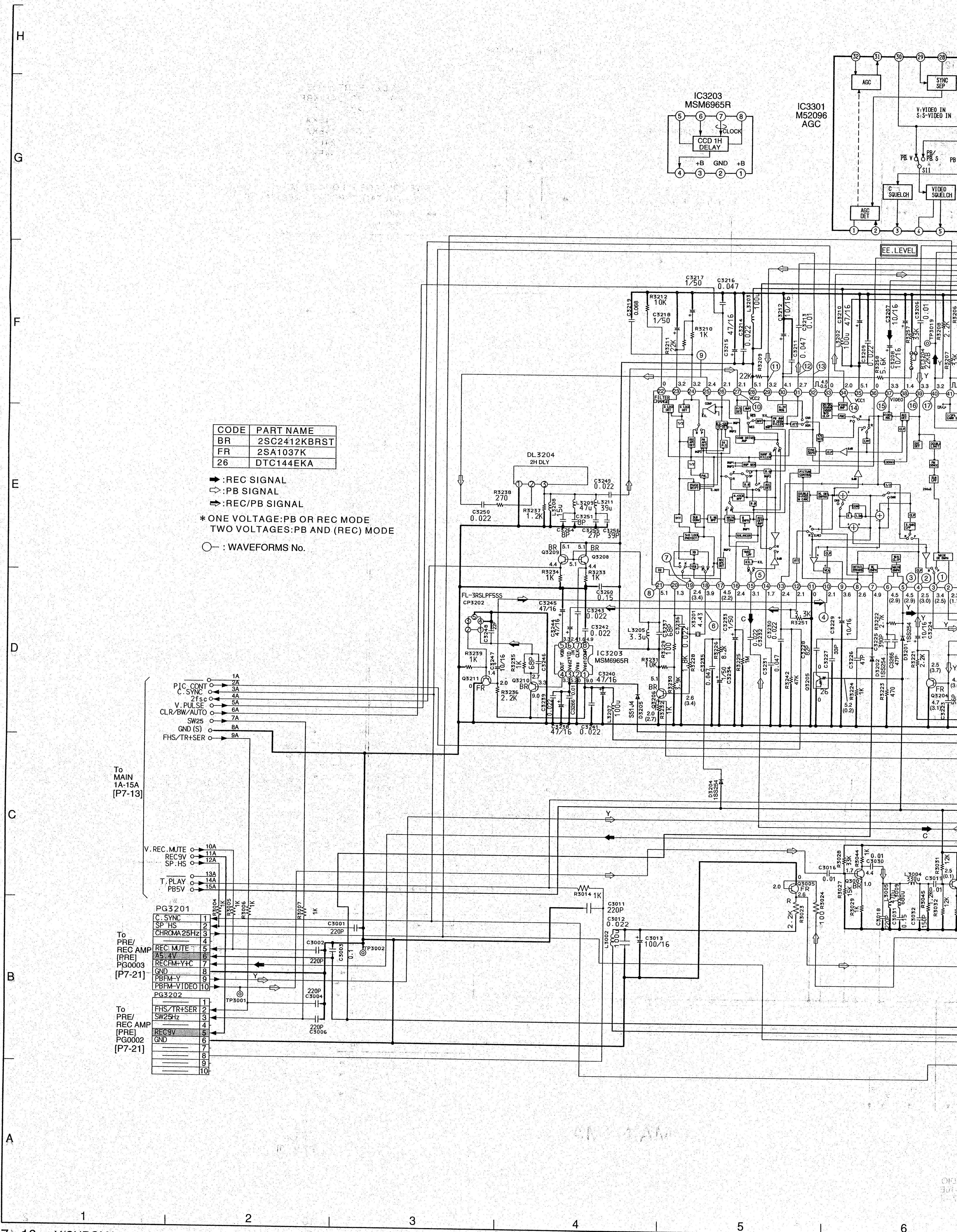
➡ :REC SIGNAL

⇨ :PB SIGNAL

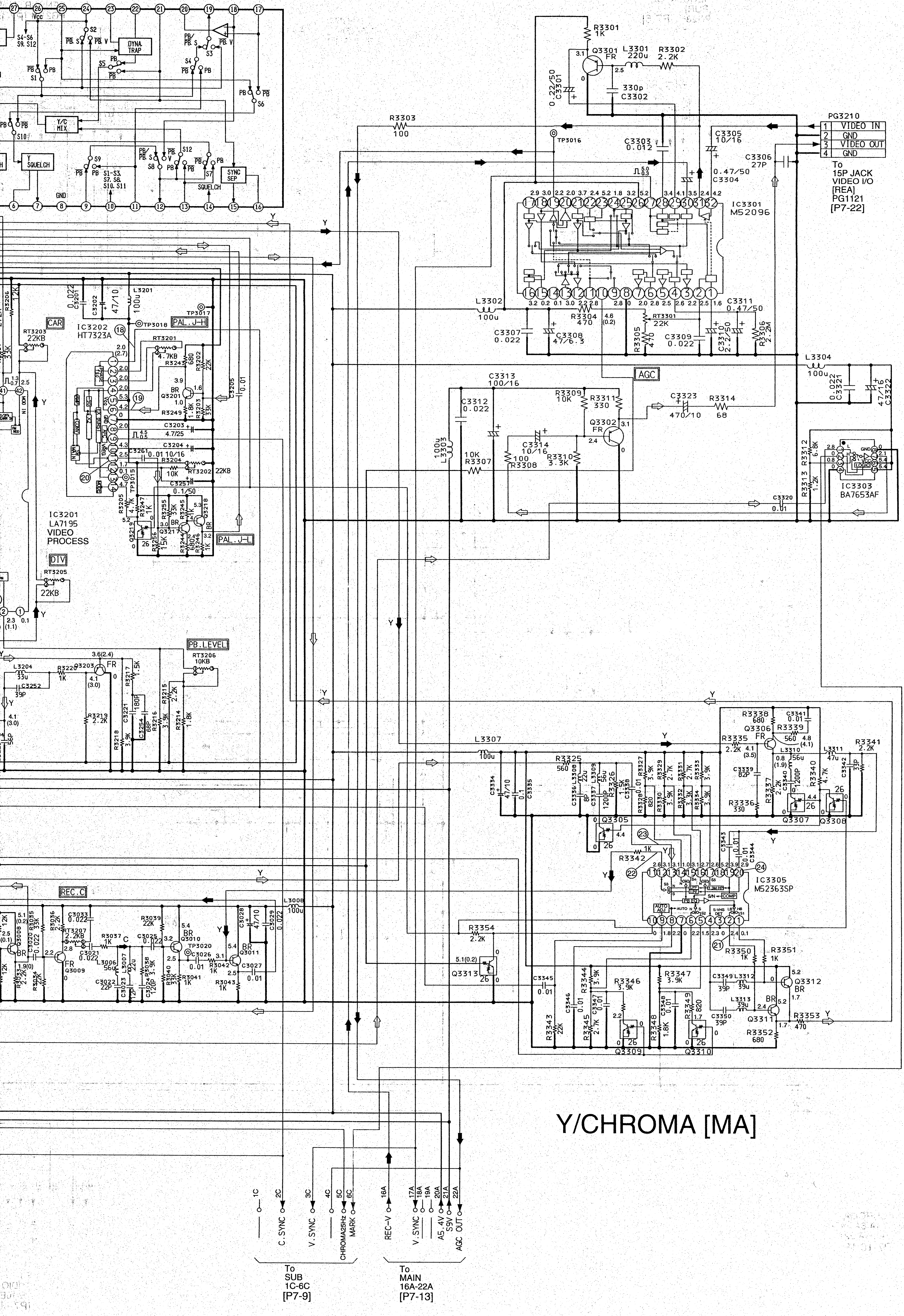
➡ :REC/PB SIGNAL

* ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

○— : WAVEFORMS No.

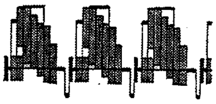
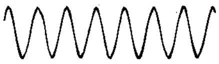
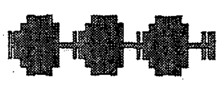
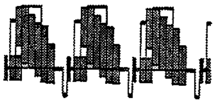
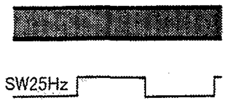
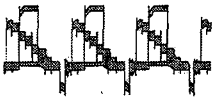
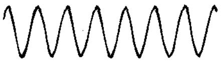
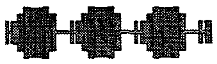
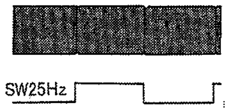
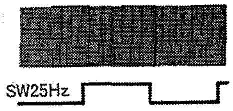
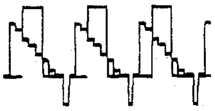
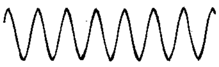
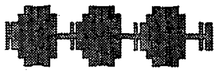
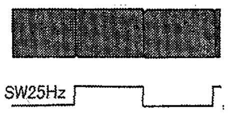
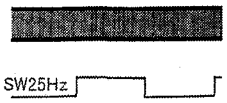
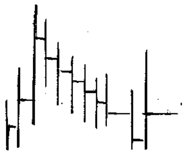
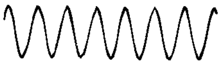
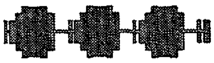
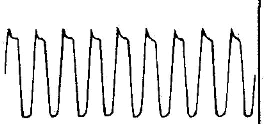
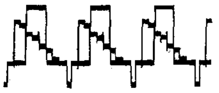
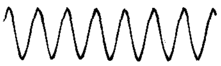
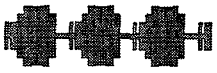
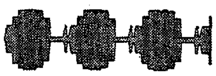
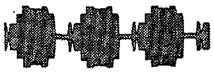
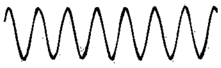
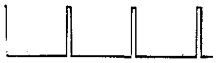
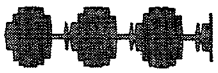
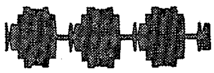
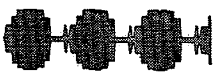
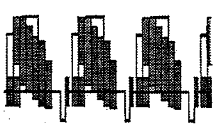
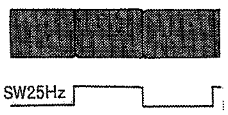


H
G
F
E
D
C
B
A
1
2
3
4
5
6
IC3203
MSM6965R
CCD 1H DELAY
CLOCK
+B
GND
+B
IC3301
M52096
AGC
AGC
SYNC SEP
V:VIDEO IN
S:S-VIDEO IN
PB V
PB/PB S
S11
C SQUELCH
VIDEO SQUELCH
AGC DET
EE.LEVEL
DL3204
2H DLY
FL-3RSLPF5SS
CP3202
Q3209
Q3208
Q3211
Q3210
Q3206
Q3205
Q3204
Q3005
Q3004
X3201
4.43
D3205
SS1J4
D3204
1SS254
D3202
1SS254
D3201
1SS254
FILTER CHANGE
VCC1
VCC2
VIDEO
To
MAIN
1A-15A
[P7-13]
PIC CONT
C.SYNC
2fsc
V.PULSE
CLR/BW/AUTO
SW25
GND (S)
FHS/TR+SER
V.REC.MUTE
REC9V
SP.HS
T.PLAY
PB5V
PG3201
C.SYNC
SP HS
CHROMA25Hz
REC MUTE
A5.4V
RECFM-Y+C
GND
PBFM-Y
PBFM-VIDEO
To
PRE/
REC AMP
[PRE]
PG0003
[P7-21]
PG3202
FHS/TR+SER
SW25Hz
REC9V
GND
To
PRE/
REC AMP
[PRE]
PG0002
[P7-21]
TP3001
TP3002
TP3019
Y
C

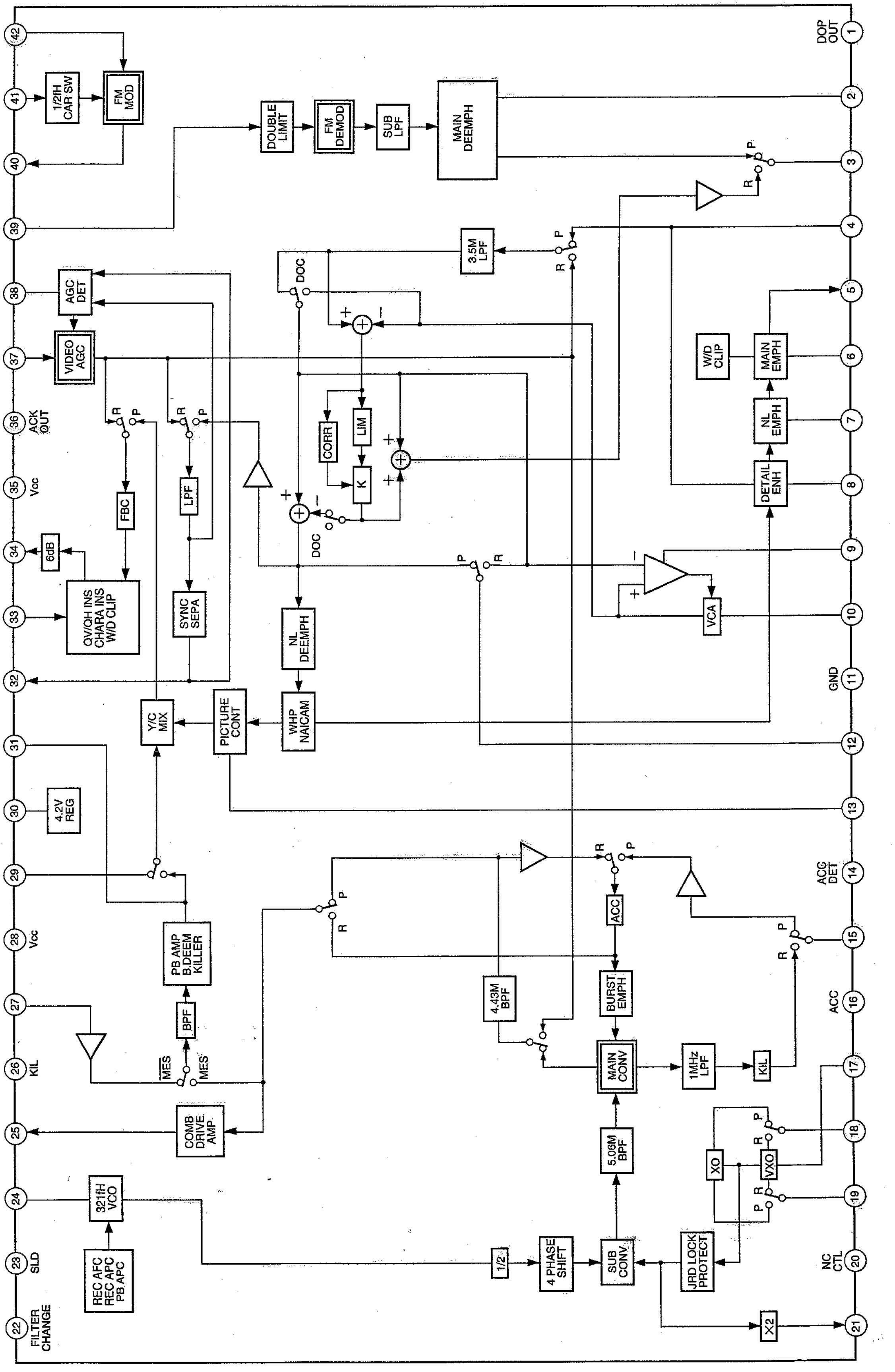

IC3201
LA7195
VIDEO
PROCESS
IC3202
HT7323A
IC3301
M52096
IC3303
BA7653AF
IC3305
M52363SP
PG3210
VIDEO IN
GND
VIDEO OUT
GND
To
15P JACK
VIDEO I/O
[REA]
PG1121
[P7-22]
DYNA TRAP
Y/C MIX
Y SQUELCH
SYNC SEP
SQUELCH
CAR
PAL. J-H
PAL. J-L
DIV
PB. LEVEL
REC. C
AGC
1C
C. SYNC 2C
V. SYNC 3C
4C
CHROMA25Hz 5C
MARK 6C
REC-V 16A
V. SYNC 17A
18A
19A
A5. 4V 20A
S9V 21A
AGC OUT 22A
To
SUB
1C-6C
[P7-9]
To
MAIN
16A-22A
[P7-13]
7
8
9
10
11
12

Y/CHROMA [MA]

Y/CHROMA WAVEFORMS

1-A IC3201-3 560mVp-p 0.2V/20.0µsec.cm REC	6-A IC3201-18 640mVp-p 0.2V/200nsec.cm REC	10-A IC3201-27 200mVp-p 0.2V/20.0µsec.cm REC/PLAY	15-A IC3201-37 1.0Vp-p 0.5V/20.0µsec.cm REC	22-A IC3305-12 450mVp-p 0.1V/5.0msec.cm REC
				
1-B IC3201-3 530mVp-p 0.1V/20.0µsec.cm PLAY	6-B IC3201-18 840mVp-p 0.2V/200nsec.cm PLAY	11-A IC3201-29 400mVp-p 0.5V/20.0µsec.cm REC	16-A IC3201-39 500mVp-p 0.2V/5.0msec.cm PLAY	23-A IC3305-13 320mVp-p 0.1V/5.0msec.cm PLAY
				
2-A IC3201-4 560mVp-p 0.2V/20.0µsec.cm REC/PLAY	7-A IC3201-19 630mVp-p 0.2V/200nsec.cm REC	11-B IC3201-29 800mVp-p 0.5V/20.0µsec.cm PLAY	17-A IC3201-40 1.0Vp-p 0.2V/5.0msec.cm REC	24-A IC3305-20 300mVp-p 0.1V/5.0msec.cm REC
				
3-A IC3201-5 0.8Vp-p 0.5V/20.0µsec.cm REC	7-B IC3201-19 720mVp-p 0.2V/200nsec.cm PLAY	12-A IC3201-31 400mVp-p 0.5V/20.0µsec.cm REC	18-A IC3202-1 600mVp-p 0.2V/20.0nsec.cm REC/PLAY	
				
4-A IC3201-10 500mVp-p 0.1V/20.0µsec.cm REC/PLAY	8-A IC3201-21 640mVp-p 0.2V/200nsec.cm REC	12-B IC3201-31 700mVp-p 0.5V/20.0µsec.cm PLAY	19-A IC3202-6 250mVp-p 0.1V/20.0µsec.cm PLAY	
				
5-A IC3201-15 400mVp-p 0.2V/20.0µsec.cm REC	8-B IC3201-21 700mVp-p 0.2V/200nsec.cm PLAY	13-A IC3201-32 4.5Vp-p 2V/20.0µsec.cm REC/PLAY	20-A IC3202-11 500mVp-p 0.1V/20.0µsec.cm PLAY	
				
5-B IC3201-15 100mVp-p 0.2V/20.0µsec.cm PLAY	9-A IC3201-25 900mVp-p 0.2V/20.0µsec.cm REC/PLAY	14-A IC3201-34 2.0Vp-p 0.2V/20.0µsec.cm REC/PLAY	21-A IC3305-2 430mVp-p 0.2V/5.0msec.cm PLAY	
				

IC3201
LA7195


DOP OUT
1/2fH CAR SW
FM MOD
DOUBLE LIMIT
FM DEMOD
SUB LPF
MAIN DEEMPH
P
R
3.5M LPF
DOC
AGC DET
VIDEO AGC
ACK OUT
Vcc
FBC
LPF
CORR
LIM
K
6dB
QV/QH INS CHARA INS W/D CLIP
SYNC SEPA
NL DEEMPH
WHP NAICAM
PICTURE CONT
Y/C MIX
W/D CLIP
MAIN EMPH
NL EMPH
DETAIL ENH
VCA
GND
4.2V REG
ACC DET
ACC
PB AMP B.DEEM KILLER
BPF
MES
KIL
COMB DRIVE AMP
4.43M BPF
BURST EMPH
MAIN CONV
1MHz LPF
KIL
5.06M BPF
XO
VXO
321fH VCO
REC AFC REC APC PB APC
1/2
4 PHASE SHIFT
SUB CONV
JRD LOCK PROTECT
X2
SLD
NC CTL
FILTER CHANGE
1
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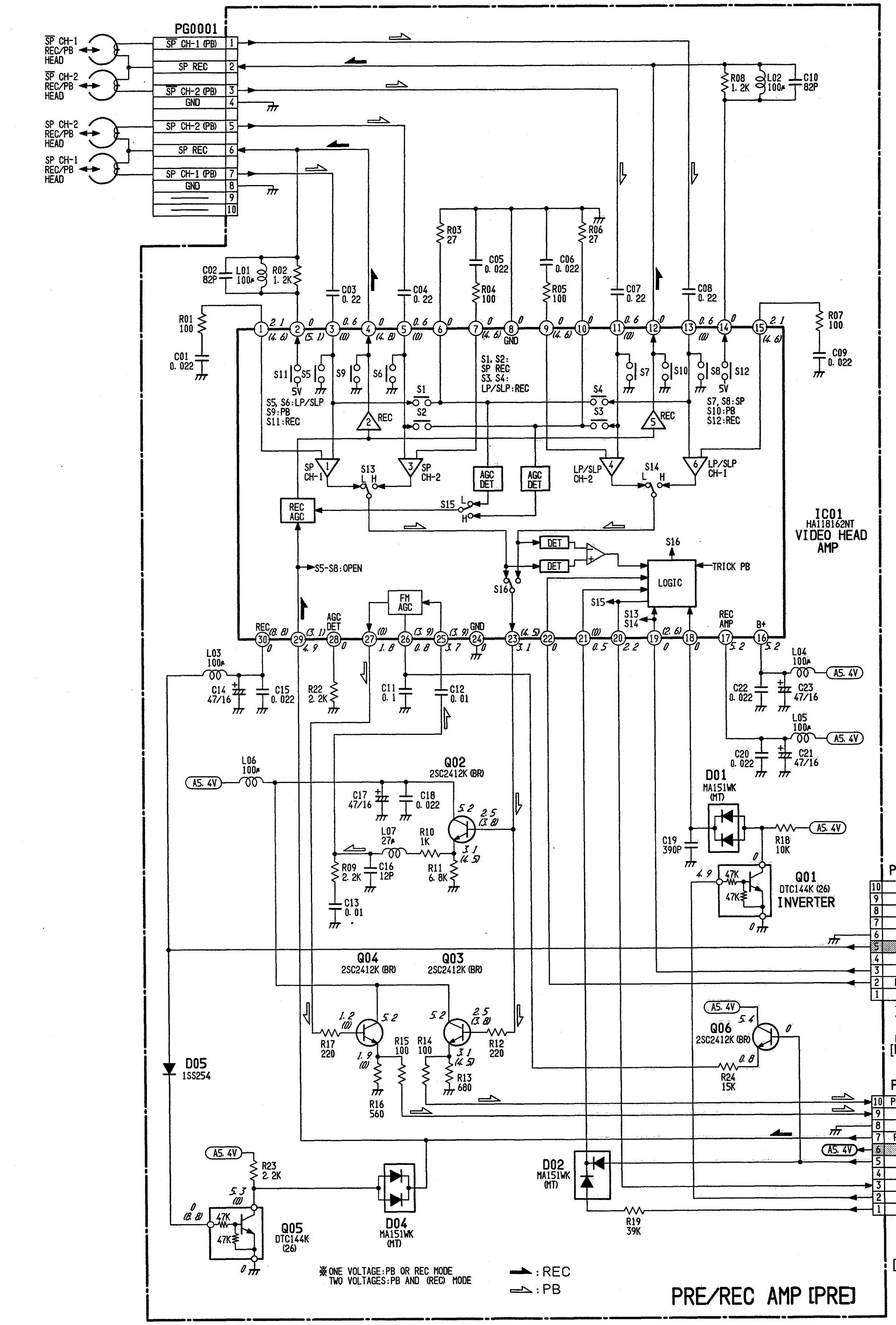
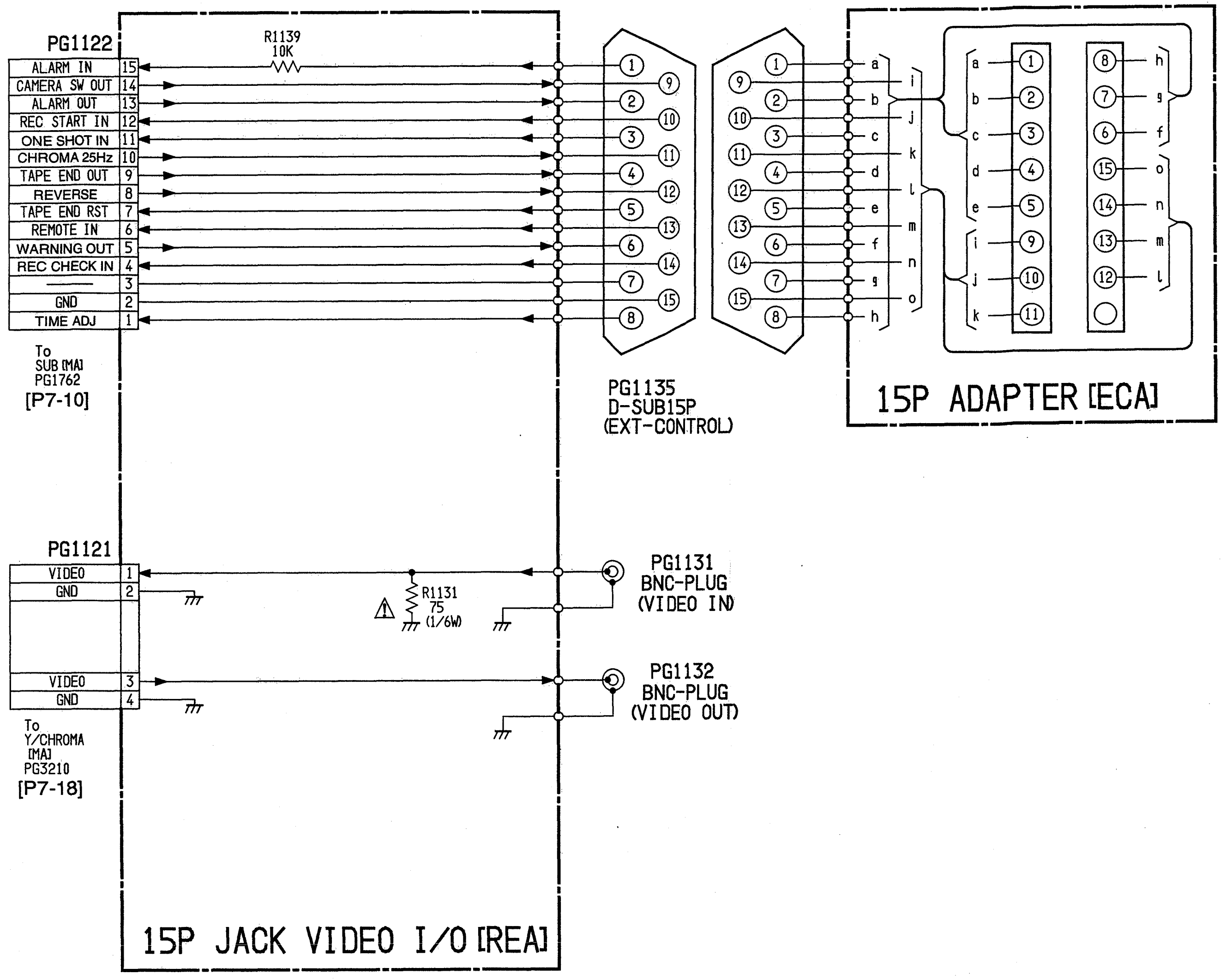
C
B
A

1 2 3 4

PRE/REC AMP [PRE] SCHEMATIC DIAGRAM


PG0001
SP CH-1 REC/PB HEAD
SP CH-2 REC/PB HEAD
SP CH-1 (PB)
SP REC
SP CH-2 (PB)
GND
IC01
HA118162NT
VIDEO HEAD AMP
REC AGC
AGC DET
FM AGC
LOGIC
TRICK PB
S5-S8:OPEN
S1, S2: SP REC
S3, S4: LP/SLP:REC
S5, S6:LP/SLP
S9:PB
S11:REC
S7, S8:SP
S10:PB
S12:REC
Q01 DTC144K (26) INVERTER
Q02 2SC2412K (BR)
Q03 2SC2412K (BR)
Q04 2SC2412K (BR)
Q05 DTC144K (26)
Q06 2SC2412K (BR)
D01 MA151WK (MT)
D02 MA151WK (MT)
D04 MA151WK (MT)
D05 1SS254
A5. 4V
PG0002
GND
REC9V
SW25Hz
FHS/TR+SER
To Y/CHROMA (MA) PG3202 [P7-16]
PG0003
PB FM (VIDEO)
PB FM (Y)
GND
REC FM (Y+C)
A5. 4V
REC MUTE
CHROMA25Hz
SP SH
C. SYNC
To Y/CHROMA (MA) PG3201 [P7-16]
※ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE
: REC
: PB
PRE/REC AMP [PRE]

15PJACK VIDEO I/O [REA], 15P ADAPTER [ECA] SCHEMATIC DIAGRAM


PG1122
ALARM IN 15
CAMERA SW OUT 14
ALARM OUT 13
REC START IN 12
ONE SHOT IN 11
CHROMA 25Hz 10
TAPE END OUT 9
REVERSE 8
TAPE END RST 7
REMOTE IN 6
WARNING OUT 5
REC CHECK IN 4
3
GND 2
TIME ADJ 1
R1139 10K
To SUB (MA) PG1762 [P7-10]
PG1135 D-SUB15P (EXT-CONTROL)
15P ADAPTER [ECA]
PG1121
VIDEO 1
GND 2
VIDEO 3
GND 4
R1131 75 (1/6W)
PG1131 BNC-PLUG (VIDEO IN)
PG1132 BNC-PLUG (VIDEO OUT)
To Y/CHROMA (MA) PG3210 [P7-18]
15P JACK VIDEO I/O [REA]

IDENTIFICATION OF PARTS LOCATION

MA [MAIN]

Symbol No.	Parts Location
#	
#1902A	A-2C
#3001	A-3D
#3002	A-2E
BL	
BL1901	A-3B
BL1902	A-2D
BT	
BT1901	A-4B
BZ	
BZ1901	A-2D
C	
C1404	A-6G
C1405	A-5G
C1406	A-6G
C1408	A-6G
C1409	A-6F
C1410	A-6F
C1411	B-6F
C1412	A-6F
C1413	A-6F
C1414	A-6G
C1415	A-6G
C1416	A-6G
C1417	A-6G
C1418	A-6G
C1419	A-6H
C1420	A-5H
C1421	B-5H
C1422	B-6H
C1423	B-6H
C1424	A-6H
C1425	A-5H
C1426	B-6H
C1430	A-6F
C1431	A-6E
C1432	A-6G
C1433	A-6G
C1434	A-6G
C1437	A-5G
C1439	A-6G
C1440	A-6G
C1441	A-5H
C1442	B-6H
C1443	A-5H
C1501	B-3B
C1502	A-2B
C1504	B-2B
C1505	A-2B
C1506	A-2B
C1507	A-2C
C1508	B-2C
C1509	B-2C
C1510	B-2C
C1511	B-2C
C1512	B-2C
C1513	B-2C
C1515	B-1B
C1516	A-1B
C1518	B-2B
C1601	B-4D
C1602	B-4D
C1603	B-4D
C1604	A-4D
C1605	B-4C
C1606	B-4D
C1607	B-2A
C1608	B-3B
C1609	B-2B
C1610	A-1B
C1611	B-1B
C1612	A-1B
C1613	A-2B
C1614	B-2B
C1615	B-2A
C1616	B-1B
C1617	B-1B
C1619	B-2B
C1620	A-3A
C1621	B-3A
C1622	B-3C
C1625	B-4E
C1626	A-2A
C1627	A-2A
C1628	B-2A
C1629	B-2A
C1630	B-2A
C1631	B-2A
C1632	B-1A
C1633	B-2B
C1634	B-3B
C1635	B-4D
C1638	B-1C
C1639	A-1A
C1642	A-2B
C1721	B-4F
C1724	A-5H
C1725	A-6F
C1726	B-4G
C1727	A-4F
C1729	B-4G
C1730	B-5F
C1731	B-4G
C1732	B-5H
C1902	A-3B
C1903	A-3B
C1904	B-4B
C1905	B-2D
C1906	B-2D
C1907	B-2C
C1908	B-2C
C1909	B-4A
C1910	B-4A
C1911	A-4A
C1912	B-3C
C1913	A-2C
C1914	A-3B
C1915	B-4D
C1916	B-4C
C1917	B-4C
C3001	B-2H
C3002	B-2H
C3003	B-2H
C3004	B-2D
C3006	B-2D
C3011	B-2D
C3012	B-2E
C3013	A-2E
C3016	B-2G
C3018	B-1G
C3019	B-1G
C3020	B-1G
C3021	B-1H
C3022	B-2H
C3023	B-1H
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C3025	B-1H
C3026	B-1H
C3027	B-1H
C3028	A-1H
C3029	B-1H
C3030	B-1G
C3031	B-1H
C3032	B-1H
C3033	B-1H
C3201	B-4H
C3202	A-3H
C3203	A-4G
C3204	A-4G
C3205	A-3G
C3206	B-2G
C3207	A-2G
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C3214	B-2F
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C3252	B-1F
C3254	B-1G
C3255	B-3F
C3256	B-3F
C3257	A-4G
C3260	B-1F
C3261	B-3H
C3264	B-3F
C3265	B-1G
C3266	A-2E
C3301	A-2E
C3302	B-2E
C3303	B-2E
C3304	A-3F
C3305	A-3E
C3306	B-3F
C3307	B-3E
C3308	A-4F
C3309	B-3E
C3310	A-3F
C3311	A-3F
C3312	B-2D
C3313	A-2E
C3314	A-2D
C3320	B-2E
C3321	B-2E
C3322	A-2E
C3323	A-2E
C3334	A-2G
C3335	B-3G
C3336	B-3G
C3337	A-3H
C3338	B-3G
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C3341	B-3H
C3342	B-2H
C3343	B-3H
C3344	B-3H
C3345	A-2G
C3346	B-2G
C3347	B-2G
C3348	B-2H
C3349	B-2H
C3350	B-2H
CP	
CP3202	A-1E
D	
D1405	B-6F
D1407	A-6G
D1410	A-6H
D1411	A-6F
D1412	A-5H
D1413	B-6F
D1414	A-6F
D1415	B-6F
D1420	B-6H
D1601	A-3B
D1602	A-4D
D1603	A-3B
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D1605	A-2A
D1609	A-4D
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D1702	A-5E
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D1904	A-4C
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D1908	A-4B
D1909	A-4B
D1910	A-4B
D1911	A-2C
D3201	A-1G
D3202	A-1G
D3204	A-1E
D3205	A-2F
DL	
DL3204	A-3G
IC	
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IC1402	A-5G
IC1601	A-4D
IC1602	A-4B
IC1603	A-2A
IC1604	A-3A
IC1605	B-2B
IC1606	B-2B
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IC1903	B-3D
IC1904	A-4D
IC1905	B-3B
IC3201	A-2F
IC3202	A-3G
IC3203	A-2E
IC3301	A-3E
IC3303	B-2E
IC3305	A-2G
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L1402	A-6G
L1502	A-2C
L1503	A-2C
L1601	A-4D
L1703	A-6E
L3002	A-2E
L3004	A-1G
L3005	A-1G
L3006	A-1H
L3007	A-1H
L3008	A-1H
L3009	A-2H
L3201	A-3H
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L3308	A-3G
L3309	A-3G
L3310	A-2H
L3311	A-3H
L3312	A-2H
L3313	A-2H
PG	
PG1401	A-6H
PG1601	A-2B
PG1602	A-1B
PG1603	A-1A
PG1762	A-4F
PG1901	A-4C
PG1902	A-4A
PG1903	A-3E
PG1904	A-4A
PG1905	A-3A
PG1906	A-3A
PG3201	A-2H
PG3202	A-2D
PG3210	A-3F
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Q1407	B-6F
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Q1412	B-6H
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Q1415	B-6E
Q1417	B-6G
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Q1422	B-6H
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Q1511	B-2B
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Q1602	B-2B
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Q1612	B-4D
Q1613	B-4D
Q1614	B-4D
Q1615	B-4E
Q1616	B-1C
Q1618	B-1B
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Q1621	B-2B
Q1622	B-2B
Q1713	B-5G
Q1715	B-4F
Q1716	B-4G
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Q1719	B-4G
Q1720	B-5H
Q1721	B-4F
Q1723	B-4F
Q1724	B-5F
Q1726	B-5F
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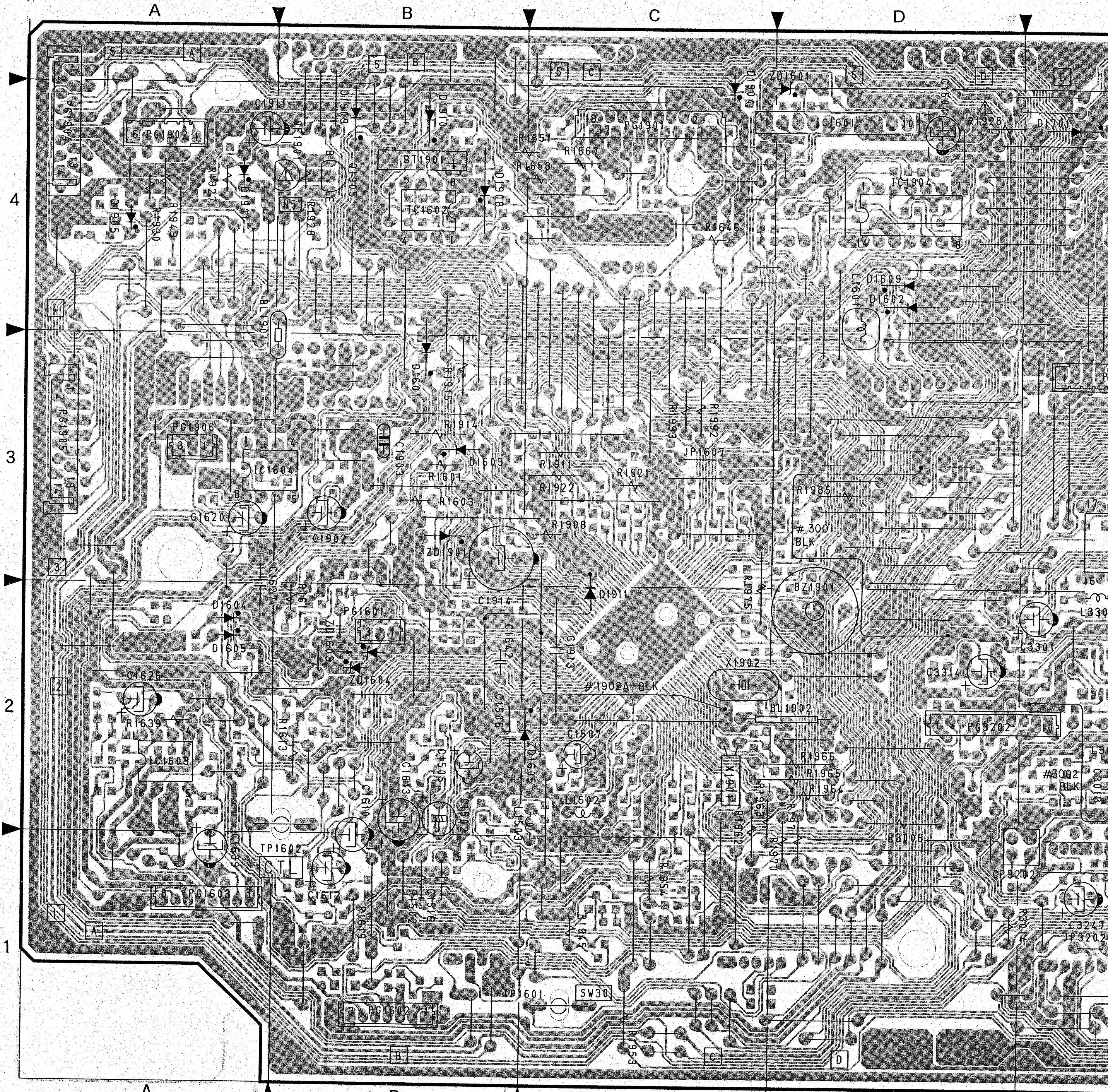
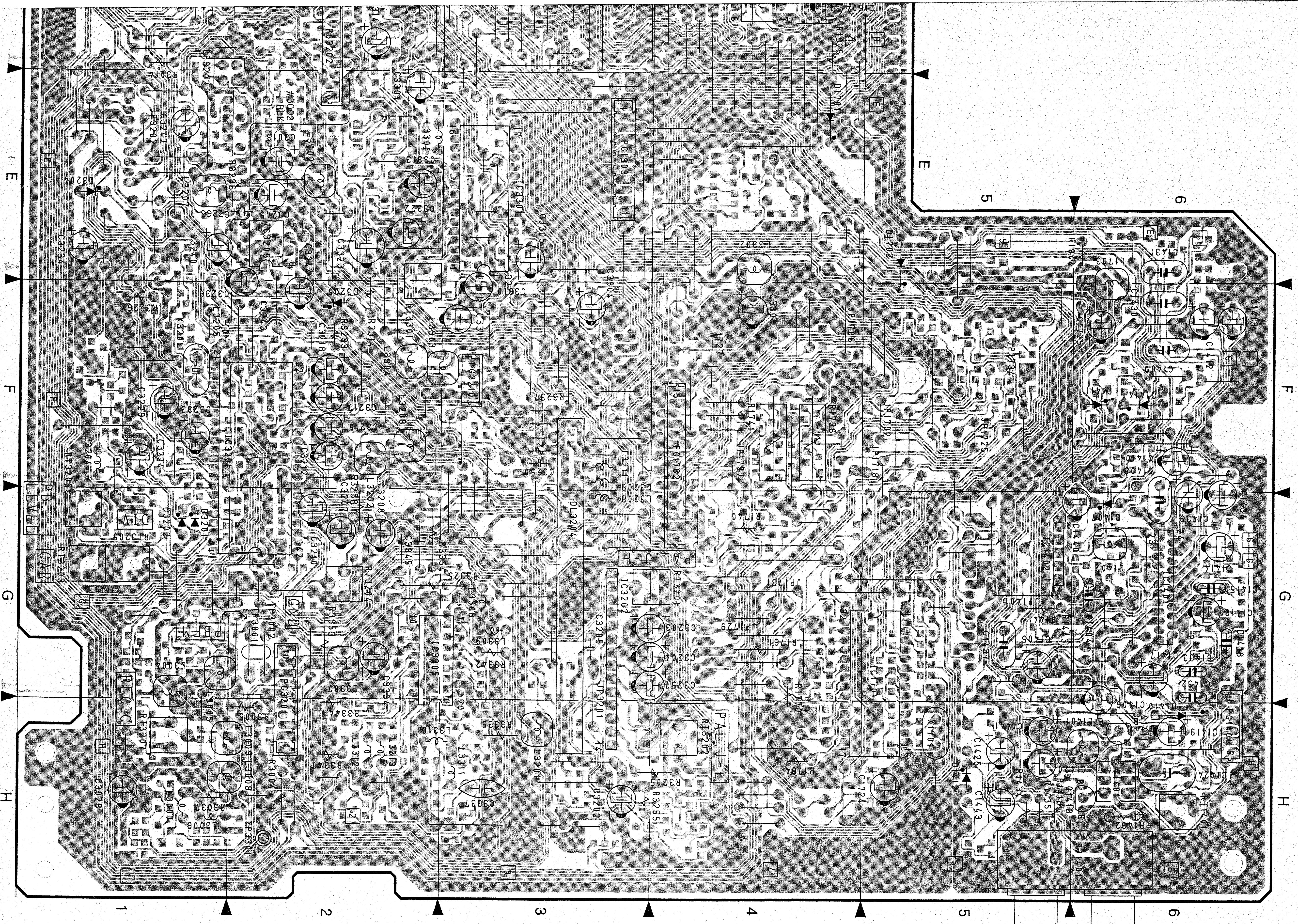
Q1905	A-4B
Q1906	B-4A
Q1907	B-1C
Q1909	B-4B
Q1910	B-4B
Q3005	B-2E
Q3007	B-1G
Q3008	B-1G
Q3009	B-1H
Q3010	B-1H
Q3011	B-1H
Q3201	B-3H
Q3203	B-1G
Q3204	B-1F
Q3205	B-1F
Q3206	B-1F
Q3208	B-2F
Q3209	B-2F
Q3210	B-1E
Q3211	B-1E
Q3217	B-4H
Q3218	B-4H
Q3219	B-4H
Q3301	B-2E
Q3302	B-2D
Q3305	B-3H
Q3306	B-3H
Q3307	B-2H
Q3308	B-2H
Q3309	B-2H
Q3310	B-2H
Q3311	B-2H
Q3312	B-2H
Q3313	B-3G
QF	
QF1901	A-4B
R	
R1402	B-5G
R1403	B-5H
R1405	B-6G
R1406	B-6F
R1407	B-6G
R1408	B-6G
R1409	B-6G
R1410	B-6G
R1411	B-5G
R1413	B-6G
R1414	B-6F
R1415	B-6E
R1416	B-6G
R1417	B-6F
R1418	A-5H
R1419	B-6F
R1420	B-6G
R1422	B-6G
R1423	B-6G
R1424	B-6G
R1425	B-6G
R1426	B-6G
R1427	B-6H
R1428	B-6H
R1429	B-6H
R1430	B-6H
R1431	B-5H
R1432	A-6H
R1433	B-5G
R1434	A-5H
R1435	A-5H
R1436	B-5H
R1439	B-6G
R1441	A-5G
R1443	A-5G
R1444	B-6G
R1445	B-6G
R1446	B-6G
R1447	B-6G
R1449	B-6F
R1450	B-6E
R1451	B-6G
R1452	B-6E
R1453	B-6F
R1501	B-1C
R1502	A-1B
R1505	B-2B
R1507	B-2C
R1509	B-1B
R1510	B-1B
R1511	B-2B
R1513	B-1C
R1514	B-2B
R1515	B-2C
R1516	B-2C
R1517	B-2B
R1601	A-3B
R1602	B-3B
R1603	A-3B
R1604	B-2A
R1605	B-2B
R1606	B-2B
R1607	B-1B
R1608	B-1B
R1609	B-1B
R1610	B-2B
R1611	B-1B
R1612	B-2B
R1613	A-2B
R1614	A-2B
R1615	B-2A
R1616	B-2B
R1617	B-2A
R1618	B-2A
R1619	A-1B
R1620	B-3A
R1621	B-3A
R1622	B-3A
R1623	B-3B
R1624	B-3A
R1625	B-3A
R1626	B-3A
R1627	B-3B
R1632	B-4E
R1633	B-4E
R1636	B-2A
R1637	B-2A
R1638	B-2A
R1639	A-2A
R1640	B-2A
R1641	B-2A
R1642	B-2A
R1643	B-2A
R1644	B-2B
R1645	B-4C
R1646	A-4C
R1647	B-4C
R1648	B-4C
R1649	B-4C
R1650	B-4C
R1651	A-4C
R1652	B-4C
R1653	B-4C
R1654	B-4C
R1655	B-4B
R1656	B-4C
R1657	B-4C
R1658	A-4C
R1659	B-4B
R1660	B-4B
R1661	B-4B
R1662	B-4B
R1663	B-4B
R1664	B-4B
R1666	B-2B
R1667	A-4C
R1669	B-4D
R1671	B-4C
R1673	B-4D
R1674	B-4D
R1675	B-1C
R1676	B-1C
R1681	B-3B
R1682	B-3B
R1683	B-1B
R1684	B-2B
R1685	B-2B
R1686	B-2B
R1687	B-2B
R1688	B-1C
R1693	B-4B
R1694	B-4B
R1736	B-4F
R1737	B-4F
R1738	A-4F
R1739	B-4G
R1740	A-4G
R1741	A-4F
R1742	B-5H
R1743	B-5F
R1759	B-4G
R1760	B-4G
R1761	A-4G
R1762	B-4G
R1763	B-4G
R1765	B-5H
R1766	B-5H
R1768	B-4G
R1769	B-4H
R1770	A-4G
R1773	B-4G
R1774	B-5F
R1775	B-5F
R1777	B-5F
R1778	B-5G
R1782	B-5G
R1783	B-5H
R1784	A-4H
R1786	B-4H
R1788	B-4G
R1790	B-4G
R1901	B-3C
R1902	B-3C
R1903	B-3C
R1904	B-3C
R1905	B-3C
R1906	B-3C
R1907	B-3C
R1908	A-3C
R1909	B-3C
R1910	B-3B
R1911	A-3C
R1912	B-3B
R1913	B-3B
R1914	A-3B
R1915	A-3B
R1916	B-3B
R1917	B-3B
R1918	B-2B
R1919	B-3C
R1920	B-3C
R1921	A-3C
R1922	A-3C
R1923	B-3C
R1924	B-3B
R1925	A-4D
R1926	B-4A
R1927	A-4A
R1928	A-4B
R1929	B-4A
R1930	A-4A
R1931	B-4A
R1932	B-3B
R1933	B-3B
R1934	B-4A
R1935	B-4A
R1936	B-4A
R1937	B-4B
R1939	B-3C
R1940	B-3C
R1941	B-3D
R1942	B-3D
R1944	A-6E
R1945	A-1C
R1946	B-3C
R1947	B-2C
R1948	B-5F
R1949	A-4A
R1951	B-5F
R1953	A-1C
R1954	A-1C
R1955	B-2C
R1956	B-2C
R1957	B-2C
R1958	B-2C
R1959	B-2C
R1960	B-2C
R1961	B-2C
R1962	A-2C
R1963	A-2C
R1964	A-2D
R1965	A-2D
R1966	A-2D
R1967	B-2C
R1968	B-2C
R1969	B-2D
R1970	A-1D
R1971	A-1D
R1972	B-2C
R1973	B-2C
R1975	A-2C
R1979	B-3D
R1980	B-3C
R1981	B-3D
R1982	B-3C
R1983	B-3D
R1984	B-3D
R1985	A-3D
R1986	B-3C
R1987	B-3C
R1988	B-3C
R1992	A-3C
R1993	A-3C
R1994	B-3C
R1995	B-4B
R1996	B-4B
R1997	B-4C
R1998	B-4B
R1999	B-4B
R3004	A-2H
R3005	A-2H
R3006	A-2D
R3007	B-2D
R3014	A-1D
R3023	B-2E
R3024	B-2E
R3027	B-1G
R3028	B-1G
R3029	B-1G
R3031	B-1G
R3032	B-1G
R3033	B-1G
R3034	B-1H
R3035	B-1H
R3036	B-1H
R3037	A-1H
R3038	B-1H
R3039	B-1H
R3040	B-1H
R3041	B-1H
R3042	B-1H
R3043	B-1H
R3044	B-1G
R3045	B-1G
R3202	B-3G
R3203	B-3H
R3204	B-4H
R3205	A-4H
R3206	B-2G
R3207	B-2G
R3208	B-2G
R3209	B-2F
R3210	B-2F
R3211	B-2F
R3212	B-2F
R3214	B-1G
R3215	B-1G
R3216	B-2G
R3217	B-1G
R3218	B-2G
R3219	B-1G
R3220	B-1G
R3221	B-1G
R3222	B-1G
R3223	B-2F
R3224	B-1F
R3225	B-1F
R3226	A-1F
R3228	B-1F
R3229	B-1F
R3230	B-1F
R3231	B-1F
R3232	B-1E
R3233	A-2F
R3234	B-2F
R3235	B-1E
R3236	A-2E
R3237	A-3F
R3238	B-3F
R3239	B-1D
R3242	B-1F
R3243	B-3H
R3244	B-4H
R3245	B-4H
R3246	B-4H
R3247	B-4H
R3249	B-3H
R3251	B-2F
R3255	A-3H
R3256	B-4H
R3257	B-2G
R3258	A-2G
R3301	B-3E
R3302	B-2E
R3303	B-3E
R3304	B-3F
R3305	B-3F
R3306	B-3F
R3307	B-2E
R3308	B-2E
R3309	B-2D
R3310	B-2D
R3311	B-2E
R3312	B-2E
R3313	B-2E
R3314	A-2F
R3325	A-2G
R3326	B-3G
R3327	B-3G
R3328	B-3G
R3329	B-3G
R3330	B-3G
R3331	B-3G
R3332	B-3G
R3333	B-3G
R3334	B-3G
R3335	A-3H
R3336	B-2H
R3337	B-2H
R3338	B-3H
R3339	B-3H
R3340	B-3H
R3341	B-2H
R3342	A-3G
R3343	B-2G
R3344	A-2H
R3345	B-2G
R3346	B-2H
R3347	A-2H
R3348	B-2H
R3349	B-2H
R3350	B-2H
R3351	B-2H
R3352	B-2H
R3353	A-2G
R3354	A-2G
RJ	
RJ1401	A-6H
RT	
RT1401	A-6H
RT3201	A-4G
RT3202	A-4H
RT3203	A-1G
RT3204	A-2G
RT3205	A-1G
RT3206	A-1G
RT3207	A-1H
RT3301	A-2F
T	
T1401	A-6H
TP	
TP1401	B-6G
TP1402	B-6G
TP1601	A-1C
TP1602	A-2B
TP1603	B-4B
TP1604	B-4A
TP1605	B-4A
TP3001	A-2G
TP3002	A-2G
TP3015	B-4H
TP3016	B-3E
TP3017	B-3H
TP3018	B-3G
TP3019	B-2G
TP3020	B-1H
TP3301	A-2H
X	
X1701	A-5H
X1901	A-2C
X1902	A-2C
X3201	A-1F
ZD	
ZD1601	A-5D
ZD1603	A-2B
ZD1604	A-2B
ZD1605	A-2C
ZD1901	A-3B

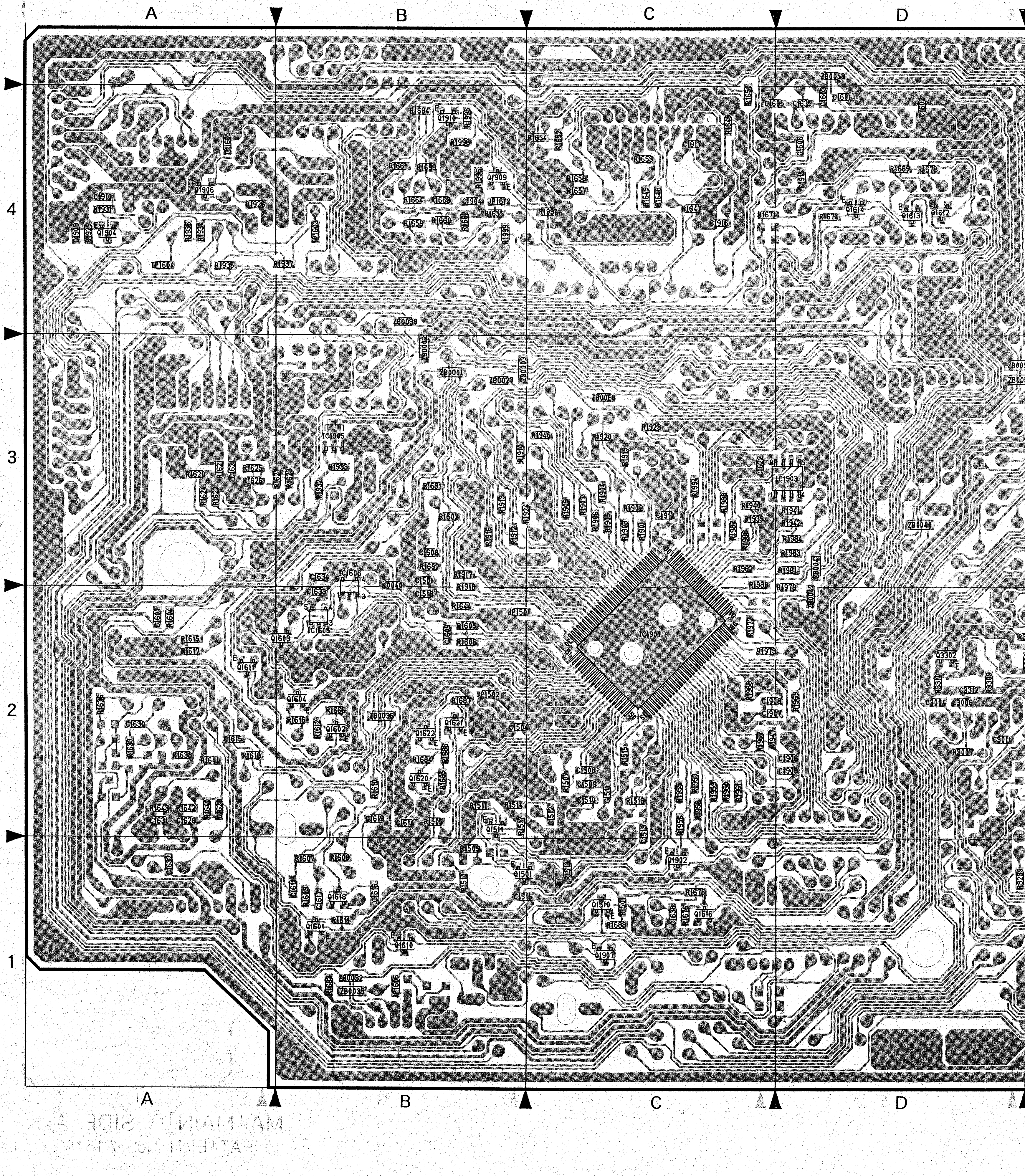
MA CIRCUIT BOARD –SIDE A–


A
B
C
D
1
2
3
4
PG1904
PG1902
C1911
QF1901
D1909
D1910
D1907
R1927
R1928
N5
D1905
R1930
R1929
D1906
BT1901
IC1602
D1908
R1651
R1658
R1667
PG1901
ZD1601
D1904
IC1601
C1604
R1925
D1701
IC1904
R1646
L1601
D1609
D1602
BL1901
D1601
R1915
R1914
R1993
R1992
JP1607
PG1905
PG1906
IC1604
C1903
D1603
R1601
R1603
R1911
R1922
R1921
R1985
#3001
BLK
C1620
C1902
ZD1901
C1914
R1908
D1911
R1975
BZ1901
C1627
R1614
P61601
ZD1603
ZD1604
D1604
D1605
C1642
C1913
#1902A BLK
X1902
BL1902
C3301
L3301
C3314
PG3202
C1626
R1639
IC1603
R1613
C1506
C1505
C1613
C1610
C1507
ZD1605
L1502
L1503
C1502
X1901
R1966
R1965
R1964
R1963
R1962
R1970
R3006
#3002
BLK
C3016
CP3202
C1639
TP1602
C1612
R1619
R1616
R1502
R1954
R1945
C3247
JP3202
R3012
PG1603
PG1502
TP1601
SW301
R1953

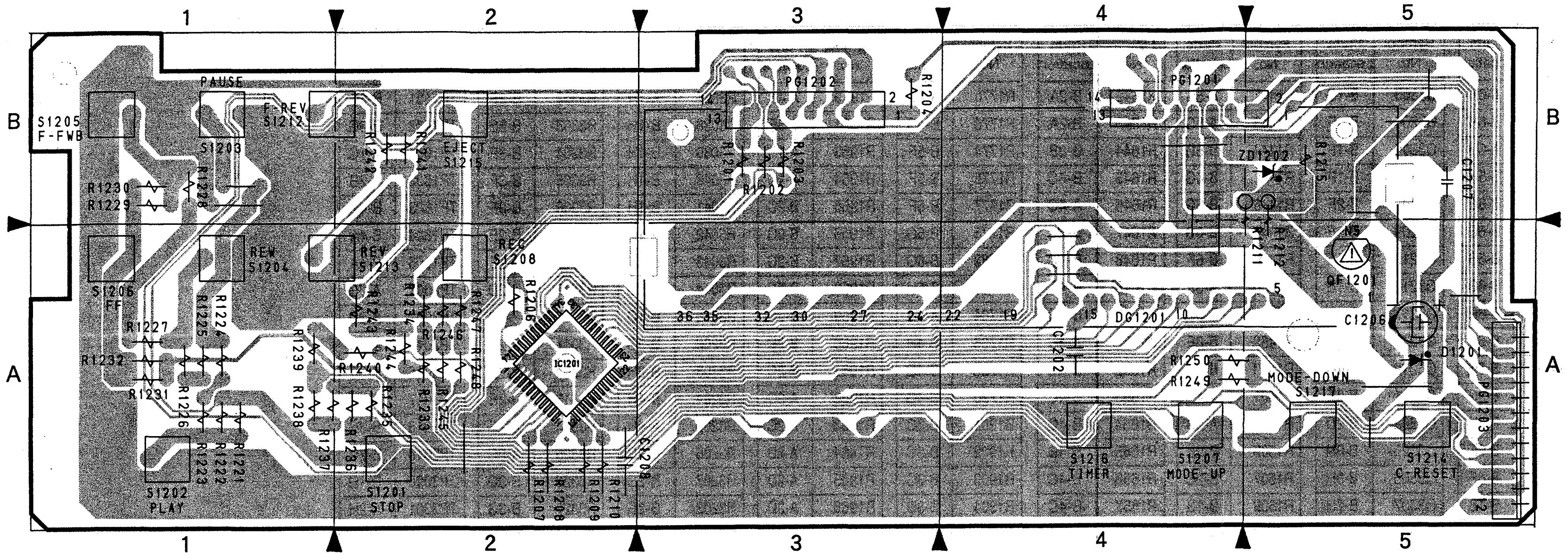

E
F
G
H
1
2
3
4
5
6
PB EVEL
CAR
REC C
GND
PB FM
PAL J-H
PAL J-L
IC3301
IC3305
IC3202
IC1401
IC1701
PG1903
PG1702
PG3201
PG3202
PG3210
PG1401
DL3204
L3302
L1703
R1701
C3397
C3328
C3234

MA [MAIN] —SIDE A—
[PATTERN No. JA1518-6]

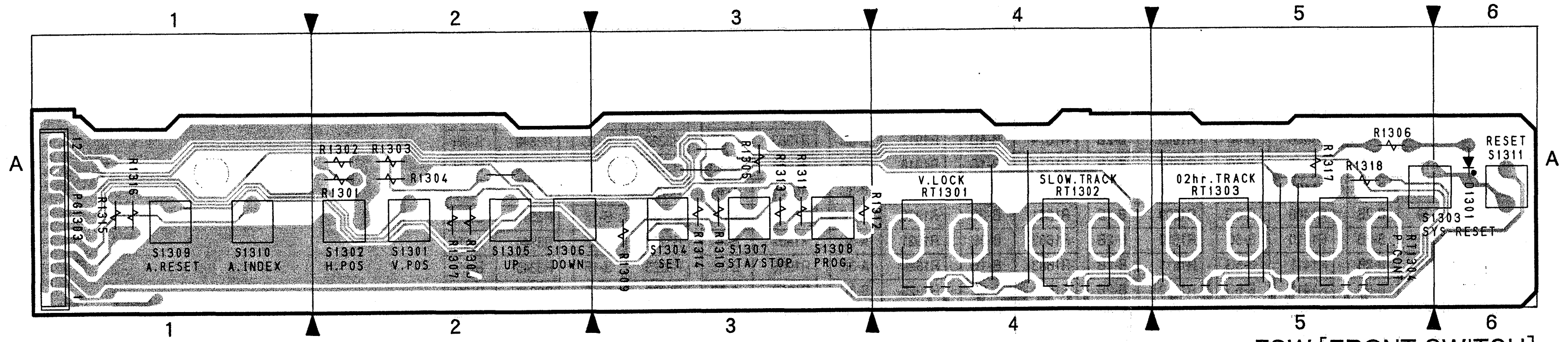
MA CIRCUIT BOARD –SIDE B–


A
B
C
D
1
2
3
4
IC1901
IC1903
IC1905
IC1606
IC1605

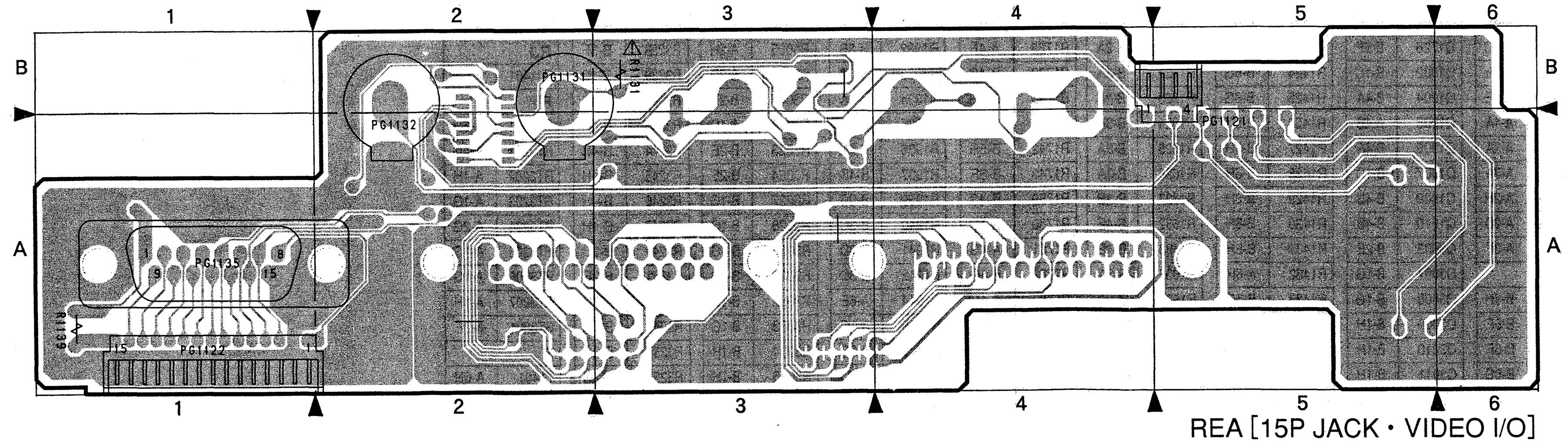
FIT, FSW, REA, MWB CIRCUIT BOARDS


1
2
3
4
5
A
B
S1205 F-FWD
PAUSE
F-REV S1212
S1203
EJECT S1215
REW S1204
REV S1213
REC S1208
S1206 FF
S1202 PLAY
S1201 STOP
IC1201
PG1202
PG1201
ZD1202
QF1201
DG1201
C1206
D1201
MODE-DOWN S1217
S1218 TIMER
S1207 MODE-UP
S1214 C-RESET
PG1203

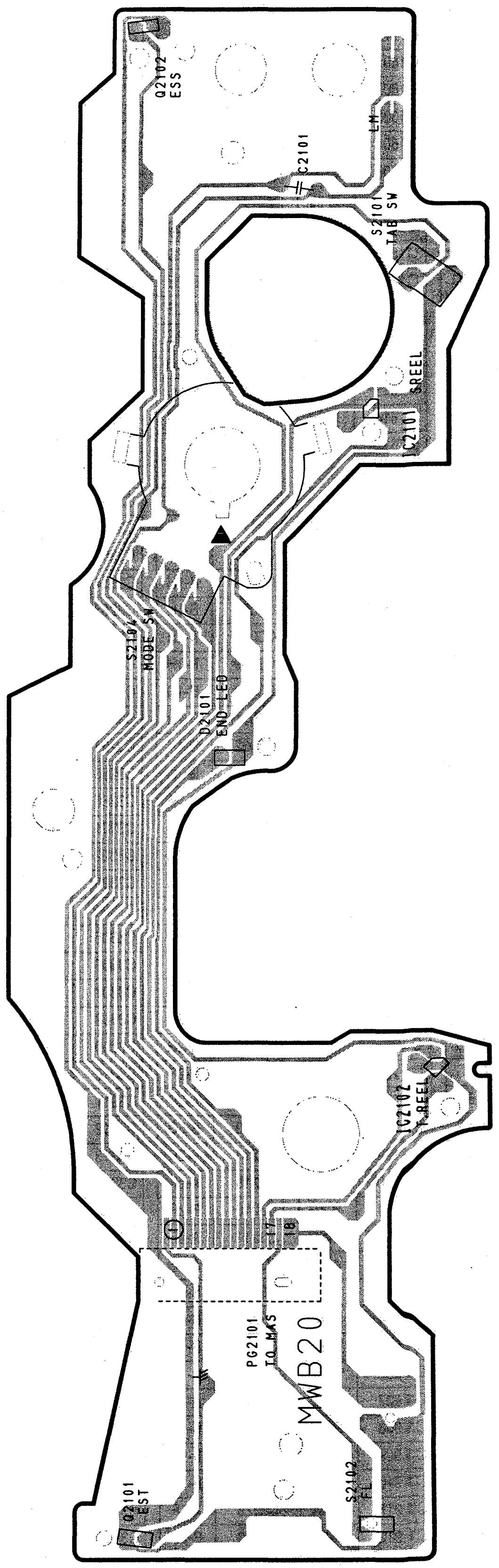
FIT [DISPLAY]
[PATTERN No. JK1414-1]


1
2
3
4
5
6
A
PG1303
R1302
R1303
R1304
R1301
R1306
RESET S1311
R1317
R1318
S1309 A.RESET
S1310 A.INDEX
S1302 H.POS
S1301 V.POS
S1305 UP
S1306 DOWN
S1304 SET
S1307 STA/STOP
S1308 PROG.
V.LOCK RT1301
SLOW.TRACK RT1302
02hr.TRACK RT1303
S1303 SYS-RESET
D1301
P.CON

FSW [FRONT SWITCH]
[PATTERN No. JK1414-1]


1
2
3
4
5
6
A
B
PG1132
PG1131
R1131
PG1121
PG1135
PG1122
R1139

REA [15P JACK・VIDEO I/O]
[PATTERN No. JK1414-1]


Q2102 ESS
C2101
S2101 TAB SW
S.REEL
IC2101
S2102 MODE SW
D2101 END LED
IC2102 T.REEL
PG2101 TO MAS
MWB20
S2102 EL
Q2101 EST

MWB [SENSOR]
[PATTERN No. JK1036-5]

IDENTIFICATION OF PARTS LOCATION

MA [MAIN]

Symbol No.	Parts Location
#	
#1902A	A-2C
#3001	A-3D
#3002	A-2E
BL	
BL1901	A-3B
BL1902	A-2D
BT	
BT1901	A-4B
BZ	
BZ1901	A-2D
C	
C1404	A-6G
C1405	A-5G
C1406	A-6G
C1408	A-6G
C1409	A-6F
C1410	A-6F
C1411	B-6F
C1412	A-6F
C1413	A-6F
C1414	A-6G
C1415	A-6G
C1416	A-6G
C1417	A-6G
C1418	A-6G
C1419	A-6H
C1420	A-5H
C1421	B-5H
C1422	B-6H
C1423	B-6H
C1424	A-6H
C1425	A-5H
C1426	B-6H
C1430	A-6F
C1431	A-6E
C1432	A-6G
C1433	A-6G
C1434	A-6G
C1437	A-5G
C1439	A-6G
C1440	A-6G
C1441	A-5H
C1442	B-6H
C1443	A-5H
C1501	B-3B
C1502	A-2B
C1504	B-2B
C1505	A-2B
C1506	A-2B
C1507	A-2C
C1508	B-2C
C1509	B-2C
C1510	B-2C
C1511	B-2C
C1512	B-2C
C1513	B-2C
C1515	B-1B
C1516	A-1B
C1518	B-2B
C1601	B-4D
C1602	B-4D
C1603	B-4D
C1604	A-4D
C1605	B-4C
C1606	B-4D
C1607	B-2A
C1608	B-3B
C1609	B-2B
C1610	A-1B
C1611	B-1B
C1612	A-1B
C1613	A-2B
C1614	B-2B
C1615	B-2A
C1616	B-1B
C1617	B-1B
C1619	B-2B
C1620	A-3A
C1621	B-3A
C1622	B-3C
C1625	B-4E
C1626	A-2A
C1627	A-2A
C1628	B-2A
C1629	B-2A
C1630	B-2A
C1631	B-2A
C1632	B-1A
C1633	B-2B
C1634	B-3B
C1635	B-4D
C1638	B-1C
C1639	A-1A
C1642	A-2B
C1721	B-4F
C1724	A-5H
C1725	A-6F
C1726	B-4G
C1727	A-4F
C1729	B-4G
C1730	B-5F
C1731	B-4G
C1732	B-5H
C1902	A-3B
C1903	A-3B
C1904	B-4B
C1905	B-2D
C1906	B-2D
C1907	B-2C
C1908	B-2C
C1909	B-4A
C1910	B-4A
C1911	A-4A
C1912	B-3C
C1913	A-2C
C1914	A-3B
C1915	B-4D
C1916	B-4C
C1917	B-4C
C3001	B-2H
C3002	B-2H
C3003	B-2H
C3004	B-2D
C3006	B-2D
C3011	B-2D
C3012	B-2E
C3013	A-2E
C3016	B-2G
C3018	B-1G
C3019	B-1G
C3020	B-1G
C3021	B-1H
C3022	B-2H
C3023	B-1H
C3024	B-1H
C3025	B-1H
C3026	B-1H
C3027	B-1H
C3028	A-1H
C3029	B-1H
C3030	B-1G
C3031	B-1H
C3032	B-1H
C3033	B-1H
C3201	B-4H
C3202	A-3H
C3203	A-4G
C3204	A-4G
C3205	A-3G
C3206	B-2G
C3207	A-2G
C3208	A-2G
C3209	B-2G
C3210	A-2G
C3211	B-2F
C3212	A-2F
C3213	B-3G
C3214	B-2F
C3215	A-2F
C3216	B-2F
C3217	A-2F
C3218	A-2F
C3219	B-2F
C3221	B-1G
C3223	B-1F
C3224	A-1F
C3225	B-2G
C3226	B-1G
C3227	B-1F
C3228	B-1F
C3229	A-1F
C3230	B-2F
C3231	B-2F
C3232	B-2F
C3233	A-1F
C3234	A-1E
C3235	B-2F
C3236	B-1F
C3237	B-2F
C3238	A-2F
C3239	B-2E
C3240	A-1E
C3241	B-1E
C3242	B-2E
C3243	A-2F
C3244	A-2F
C3245	A-2E
C3246	B-1E
C3247	A-1E
C3248	B-1E
C3249	B-3F
C3250	A-3F
C3251	B-3F
C3252	B-1F
C3254	B-1G
C3255	B-3F
C3256	B-3F
C3257	A-4G
C3260	B-1F
C3261	B-3H
C3264	B-3F
C3265	B-1G
C3266	A-2E
C3301	A-2E
C3302	B-2E
C3303	B-2E
C3304	A-3F
C3305	A-3E
C3306	B-3F
C3307	B-3E
C3308	A-4F
C3309	B-3E
C3310	A-3F
C3311	A-3F
C3312	B-2D
C3313	A-2E
C3314	A-2D
C3320	B-2E
C3321	B-2E
C3322	A-2E
C3323	A-2E
C3334	A-2G
C3335	B-3G
C3336	B-3G
C3337	A-3H
C3338	B-3G
C3339	B-3H
C3340	B-2H
C3341	B-3H
C3342	B-2H
C3343	B-3H
C3344	B-3H
C3345	A-2G
C3346	B-2G
C3347	B-2G
C3348	B-2H
C3349	B-2H
C3350	B-2H
CP	
CP3202	A-1E
D	
D1405	B-6F
D1407	A-6G
D1410	A-6H
D1411	A-6F
D1412	A-5H
D1413	B-6F
D1414	A-6F
D1415	B-6F
D1420	B-6H
D1601	A-3B
D1602	A-4D
D1603	A-3B
D1604	A-2A
D1605	A-2A
D1609	A-4D
D1701	A-4E
D1702	A-5E
D1901	A-4A
D1904	A-4C
D1905	A-4A
D1908	A-4B
D1909	A-4B
D1910	A-4B
D1911	A-2C
D3201	A-1G
D3202	A-1G
D3204	A-1E
D3205	A-2F
DL	
DL3204	A-3G
IC	
IC1401	A-6G
IC1402	A-5G
IC1601	A-4D
IC1602	A-4B
IC1603	A-2A
IC1604	A-3A
IC1605	B-2B
IC1606	B-2B
IC1701	A-5G
IC1702	B-5H
IC1901	B-2C
IC1903	B-3D
IC1904	A-4D
IC1905	B-3B
IC3201	A-2F
IC3202	A-3G
IC3203	A-2E
IC3301	A-3E
IC3303	B-2E
IC3305	A-2G
L	
L1401	A-6H
L1402	A-6G
L1502	A-2C
L1503	A-2C
L1601	A-4D
L1703	A-6E
L3002	A-2E
L3004	A-1G
L3005	A-1G
L3006	A-1H
L3007	A-1H
L3008	A-1H
L3009	A-2H
L3201	A-3H
L3202	A-2F
L3203	A-2F
L3204	A-1F
L3205	A-1F
L3207	A-1E
L3208	A-3G
L3209	A-3F
L3211	A-3F
L3301	A-2E
L3302	A-4E
L3303	A-3F
L3304	A-2F
L3307	A-2G
L3308	A-3G
L3309	A-3G
L3310	A-2H
L3311	A-3H
L3312	A-2H
L3313	A-2H
PG	
PG1401	A-6H
PG1601	A-2B
PG1602	A-1B
PG1603	A-1A
PG1762	A-4F
PG1901	A-4C
PG1902	A-4A
PG1903	A-3E
PG1904	A-4A
PG1905	A-3A
PG1906	A-3A
PG3201	A-2H
PG3202	A-2D
PG3210	A-3F
Q	
Q1403	B-5H
Q1407	B-6F
Q1408	B-6F
Q1409	B-6G
Q1410	B-6G
Q1411	A-6H
Q1412	B-6H
Q1413	A-6H
Q1414	B-5H
Q1415	B-6E
Q1417	B-6G
Q1418	B-6G
Q1419	B-6G
Q1420	B-6E
Q1421	B-6F
Q1422	B-6H
Q1424	B-5G
Q1425	B-5H
Q1427	B-6F
Q1428	B-6F
Q1501	B-1B
Q1510	B-1C
Q1511	B-2B
Q1601	B-1B
Q1602	B-2B
Q1603	B-2B
Q1604	B-2B
Q1609	B-4E
Q1610	B-1B
Q1611	B-2A
Q1612	B-4D
Q1613	B-4D
Q1614	B-4D
Q1615	B-4E
Q1616	B-1C
Q1618	B-1B
Q1620	B-2B
Q1621	B-2B
Q1622	B-2B
Q1713	B-5G
Q1715	B-4F
Q1716	B-4G
Q1718	B-4F
Q1719	B-4G
Q1720	B-5H
Q1721	B-4F
Q1723	B-4F
Q1724	B-5F
Q1726	B-5F
Q1902	B-1C
Q1904	B-4A
Q1905	A-4B
Q1906	B-4A
Q1907	B-1C
Q1909	B-4B
Q1910	B-4B
Q3005	B-2E
Q3007	B-1G
Q3008	B-1G
Q3009	B-1H
Q3010	B-1H
Q3011	B-1H
Q3201	B-3H
Q3203	B-1G
Q3204	B-1F
Q3205	B-1F
Q3206	B-1F
Q3208	B-2F
Q3209	B-2F
Q3210	B-1E
Q3211	B-1E
Q3217	B-4H
Q3218	B-4H
Q3219	B-4H
Q3301	B-2E
Q3302	B-2D
Q3305	B-3H
Q3306	B-3H
Q3307	B-2H
Q3308	B-2H
Q3309	B-2H
Q3310	B-2H
Q3311	B-2H
Q3312	B-2H
Q3313	B-3G
QF	
QF1901	A-4B
R	
R1402	B-5G
R1403	B-5H
R1405	B-6G
R1406	B-6F
R1407	B-6G
R1408	B-6G
R1409	B-6G
R1410	B-6G
R1411	B-5G
R1413	B-6G
R1414	B-6F
R1415	B-6E
R1416	B-6G
R1417	B-6F
R1418	A-5H
R1419	B-6F
R1420	B-6G
R1422	B-6G
R1423	B-6G
R1424	B-6G
R1425	B-6G
R1426	B-6G
R1427	B-6H
R1428	B-6H
R1429	B-6H
R1430	B-6H
R1431	B-5H
R1432	A-6H
R1433	B-5G
R1434	A-5H
R1435	A-5H
R1436	B-5H
R1439	B-6G
R1441	A-5G
R1443	A-5G
R1444	B-6G
R1445	B-6G
R1446	B-6G
R1447	B-6G
R1449	B-6F
R1450	B-6E
R1451	B-6G
R1452	B-6E
R1453	B-6F
R1501	B-1C
R1502	A-1B
R1505	B-2B
R1507	B-2C
R1509	B-1B
R1510	B-1B
R1511	B-2B
R1513	B-1C
R1514	B-2B
R1515	B-2C
R1516	B-2C
R1517	B-2B
R1601	A-3B
R1602	B-3B
R1603	A-3B
R1604	B-2A
R1605	B-2B
R1606	B-2B
R1607	B-1B
R1608	B-1B
R1609	B-1B
R1610	B-2B
R1611	B-1B
R1612	B-2B
R1613	A-2B
R1614	A-2B
R1615	B-2A
R1616	B-2B
R1617	B-2A
R1618	B-2A
R1619	A-1B
R1620	B-3A
R1621	B-3A
R1622	B-3A
R1623	B-3B
R1624	B-3A
R1625	B-3A
R1626	B-3A
R1627	B-3B
R1632	B-4E
R1633	B-4E
R1636	B-2A
R1637	B-2A
R1638	B-2A
R1639	A-2A
R1640	B-2A
R1641	B-2A
R1642	B-2A
R1643	B-2A
R1644	B-2B
R1645	B-4C
R1646	A-4C
R1647	B-4C
R1648	B-4C
R1649	B-4C
R1650	B-4C
R1651	A-4C
R1652	B-4C
R1653	B-4C
R1654	B-4C
R1655	B-4B
R1656	B-4C
R1657	B-4C
R1658	A-4C
R1659	B-4B
R1660	B-4B
R1661	B-4B
R1662	B-4B
R1663	B-4B
R1664	B-4B
R1666	B-2B
R1667	A-4C
R1669	B-4D
R1671	B-4C
R1673	B-4D
R1674	B-4D
R1675	B-1C
R1676	B-1C
R1681	B-3B
R1682	B-3B
R1683	B-1B
R1684	B-2B
R1685	B-2B
R1686	B-2B
R1687	B-2B
R1688	B-1C
R1693	B-4B
R1694	B-4B
R1736	B-4F
R1737	B-4F
R1738	A-4F
R1739	B-4G
R1740	A-4G
R1741	A-4F
R1742	B-5H
R1743	B-5F
R1759	B-4G
R1760	B-4G
R1761	A-4G
R1762	B-4G
R1763	B-4G
R1765	B-5H
R1766	B-5H
R1768	B-4G
R1769	B-4H
R1770	A-4G
R1773	B-4G
R1774	B-5F
R1775	B-5F
R1777	B-5F
R1778	B-5G
R1782	B-5G
R1783	B-5H
R1784	A-4H
R1786	B-4H
R1788	B-4G
R1790	B-4G
R1901	B-3C
R1902	B-3C
R1903	B-3C
R1904	B-3C
R1905	B-3C
R1906	B-3C
R1907	B-3C
R1908	A-3C
R1909	B-3C
R1910	B-3B
R1911	A-3C
R1912	B-3B
R1913	B-3B
R1914	A-3B
R1915	A-3B
R1916	B-3B
R1917	B-3B
R1918	B-2B
R1919	B-3C
R1920	B-3C
R1921	A-3C
R1922	A-3C
R1923	B-3C
R1924	B-3B
R1925	A-4D
R1926	B-4A
R1927	A-4A
R1928	A-4B
R1929	B-4A
R1930	A-4A
R1931	B-4A
R1932	B-3B
R1933	B-3B
R1934	B-4A
R1935	B-4A
R1936	B-4A
R1937	B-4B
R1939	B-3C
R1940	B-3C
R1941	B-3D
R1942	B-3D
R1944	A-6E
R1945	A-1C
R1946	B-3C
R1947	B-2C
R1948	B-5F
R1949	A-4A
R1951	B-5F
R1953	A-1C
R1954	A-1C
R1955	B-2C
R1956	B-2C
R1957	B-2C
R1958	B-2C
R1959	B-2C
R1960	B-2C
R1961	B-2C
R1962	A-2C
R1963	A-2C
R1964	A-2D
R1965	A-2D
R1966	A-2D
R1967	B-2C
R1968	B-2C
R1969	B-2D
R1970	A-1D
R1971	A-1D
R1972	B-2C
R1973	B-2C
R1975	A-2C
R1979	B-3D
R1980	B-3C
R1981	B-3D
R1982	B-3C
R1983	B-3D
R1984	B-3D
R1985	A-3D
R1986	B-3C
R1987	B-3C
R1988	B-3C
R1992	A-3C
R1993	A-3C
R1994	B-3C
R1995	B-4B
R1996	B-4B
R1997	B-4C
R1998	B-4B
R1999	B-4B
R3004	A-2H
R3005	A-2H
R3006	A-2D
R3007	B-2D
R3014	A-1D
R3023	B-2E
R3024	B-2E
R3027	B-1G
R3028	B-1G
R3029	B-1G
R3031	B-1G
R3032	B-1G
R3033	B-1G
R3034	B-1H
R3035	B-1H
R3036	B-1H
R3037	A-1H
R3038	B-1H
R3039	B-1H
R3040	B-1H
R3041	B-1H
R3042	B-1H
R3043	B-1H
R3044	B-1G
R3045	B-1G
R3202	B-3G
R3203	B-3H
R3204	B-4H
R3205	A-4H
R3206	B-2G
R3207	B-2G
R3208	B-2G
R3209	B-2F
R3210	B-2F
R3211	B-2F
R3212	B-2F
R3214	B-1G
R3215	B-1G
R3216	B-2G
R3217	B-1G
R3218	B-2G
R3219	B-1G
R3220	B-1G
R3221	B-1G
R3222	B-1G
R3223	B-2F
R3224	B-1F
R3225	B-1F
R3226	A-1F
R3228	B-1F
R3229	B-1F
R3230	B-1F
R3231	B-1F
R3232	B-1E
R3233	A-2F
R3234	B-2F
R3235	B-1E
R3236	A-2E
R3237	A-3F
R3238	B-3F
R3239	B-1D
R3242	B-1F
R3243	B-3H
R3244	B-4H
R3245	B-4H
R3246	B-4H
R3247	B-4H
R3249	B-3H
R3251	B-2F
R3255	A-3H
R3256	B-4H
R3257	B-2G
R3258	A-2G
R3301	B-3E
R3302	B-2E
R3303	B-3E
R3304	B-3F
R3305	B-3F
R3306	B-3F
R3307	B-2E
R3308	B-2E
R3309	B-2D
R3310	B-2D
R3311	B-2E
R3312	B-2E
R3313	B-2E
R3314	A-2F
R3325	A-2G
R3326	B-3G
R3327	B-3G
R3328	B-3G
R3329	B-3G
R3330	B-3G
R3331	B-3G
R3332	B-3G
R3333	B-3G
R3334	B-3G
R3335	A-3H
R3336	B-2H
R3337	B-2H
R3338	B-3H
R3339	B-3H
R3340	B-3H
R3341	B-2H
R3342	A-3G
R3343	B-2G
R3344	A-2H
R3345	B-2G
R3346	B-2H
R3347	A-2H
R3348	B-2H
R3349	B-2H
R3350	B-2H
R3351	B-2H
R3352	B-2H
R3353	A-2G
R3354	A-2G
RJ	
RJ1401	A-6H
RT	
RT1401	A-6H
RT3201	A-4G
RT3202	A-4H
RT3203	A-1G
RT3204	A-2G
RT3205	A-1G
RT3206	A-1G
RT3207	A-1H
RT3301	A-2F
T	
T1401	A-6H
TP	
TP1401	B-6G
TP1402	B-6G
TP1601	A-1C
TP1602	A-2B
TP1603	B-4B
TP1604	B-4A
TP1605	B-4A
TP3001	A-2G
TP3002	A-2G
TP3015	B-4H
TP3016	B-3E
TP3017	B-3H
TP3018	B-3G
TP3019	B-2G
TP3020	B-1H
TP3301	A-2H
X	
X1701	A-5H
X1901	A-2C
X1902	A-2C
X3201	A-1F
ZD	
ZD1601	A-5D
ZD1603	A-2B
ZD1604	A-2B
ZD1605	A-2C
ZD1901	A-3B

IDENTIFICATION OF PARTS LOCATION

FIT

Symbol No.	Parts Location
C	
C1202	4A
C1206	5A
C1207	5B
C1208	2A
D	
D1201	5A
DG	
DG1201	4A
IC	
IC1201	2A
PG	
PG1201	4B
PG1202	3B
PG1203	5A
QF	
QF1201	5A
R	
R1201	3B
R1202	3B
R1203	3B
R1204	3B
R1206	2A
R1207	2A
R1208	2A
R1209	2A
R1210	2A
R1211	5A
R1212	5A
R1215	5B
R1221	1A
R1222	1A
R1223	1A
R1224	1A
R1225	1A
R1226	1A
R1227	1A
R1228	1B
R1229	1B
R1230	1B
R1231	1A
R1232	1A
R1233	2A
R1234	2A
R1235	2A
R1236	2A
R1237	1A
R1238	1A
R1239	1A
R1240	2A
R1241	2B
R1242	2B
R1243	2A
R1244	2A
R1245	2A
R1246	2A
R1247	2A
R1248	2A
R1249	4A
R1250	4A
S	
S1201	2A
S1202	1A
S1203	1B
S1204	1A
S1205	1B
S1206	1A
S1207	4A
S1208	2A
S1212	1B
S1213	1A
S1214	5A
S1215	2B
S1216	4A
S1217	5A
ZD	
ZD1202	5B

FSW

Symbol No.	Parts Location
D	
D1301	6A
PG	
PG1303	1A
R	
R1301	2A
R1302	2A
R1303	2A
R1304	2A
R1305	3A
R1306	5A
R1307	2A
R1308	2A
R1309	3A
R1310	3A
R1311	3A
R1312	3A
R1313	3A
R1314	3A
R1315	1A
R1316	1A
R1317	5A
R1318	5A
RT	
RT1301	4A
RT1302	4A
RT1303	5A
RT1304	5A
S	
S1301	2A
S1302	2A
S1303	5A
S1304	3A
S1305	2A
S1306	2A
S1307	3A
S1308	3A
S1309	1A
S1310	1A
S1311	6A

REA

Symbol No.	Parts Location
PG	
PG1121	5B
PG1122	1A
PG1131	2B
PG1132	2B
PG1135	1A
R	
R1131	3B
R1139	1A

IDENTIFICATION OF PARTS LOCATION

PRE

Symbol No.	Parts Location
C	
C0001	B-4A
C0002	B-4B
C0003	B-4B
C0004	B-5B
C0005	B-4A
C0006	B-5A
C0007	B-5B
C0008	B-5B
C0009	B-5A
C0010	B-5B
C0011	B-4A
C0012	B-4A
C0013	B-4A
C0014	A-4A
C0015	B-4A
C0016	B-4A
C0017	A-4A
C0018	B-4A
C0019	B-5A
C0020	B-5A
C0021	A-5A
C0022	B-5A
C0023	A-5A
D	
D0001	B-2A
D0002	B-2B
D0004	B-3B
D0005	A-4A
IC	
IC0001	A-5A
L	
L0001	A-4B
L0002	A-5B
L0003	A-4A
L0004	A-5A
L0005	A-5A
L0006	A-5A
L0007	A-4A
PG	
PG0001	A-5B
PG0002	A-1A
PG0003	A-2B
Q	
Q0001	B-2B
Q0002	B-5A
Q0003	B-4A
Q0004	B-4A
Q0005	B-3A
Q0006	B-2B
R	
R0001	B-4A
R0002	B-4B
R0003	B-4A
R0004	B-5A
R0005	B-5A
R0006	B-5A
R0007	B-5A
R0008	B-5B
R0009	B-4A
R0010	B-4A
R0011	B-5A
R0012	B-5A
R0013	B-4A
R0014	B-4A
R0015	B-4A
R0016	B-4A
R0017	B-4A
R0018	B-2B
R0019	B-2B
R0022	B-4A
R0023	B-3A
R0024	B-2B

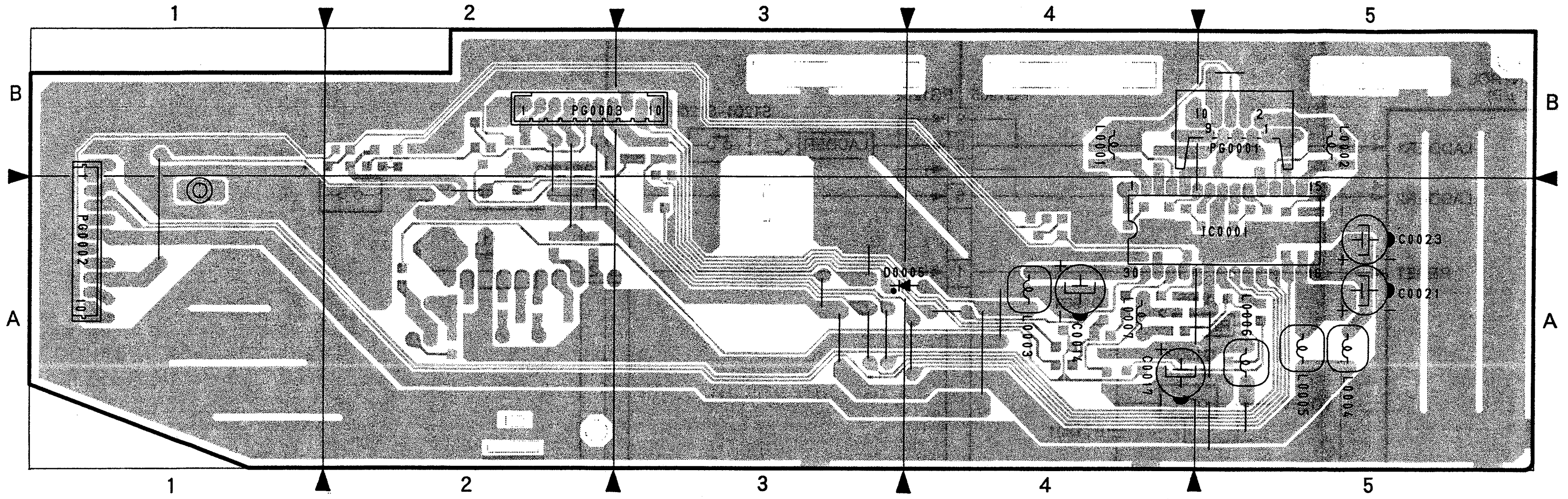
PTR

Symbol No.	Parts Location
C	
C852	6B
C853	7B
C855	5A
C856	6A
C857	6A
C858	6B
C859	6A
C867	6B
C891	1A
D	
D851	5B
D852	5A
D856	6B
D857	6A
FU	
FU851	4B
FU852	4B
FU853	2B
L	
L851	2A
PG	
PG2853	7B
Q	
Q851	6B
R	
R851	6B
R871	7A
T	
T852	4A
ZD	
ZD851	6B

PUR

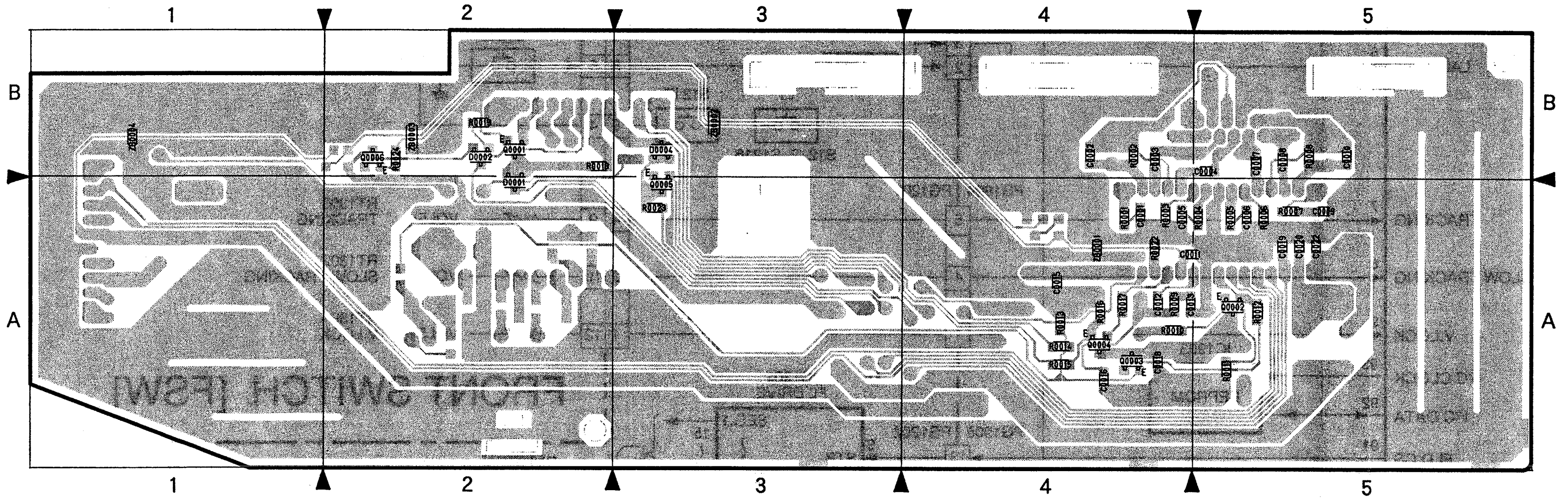
Symbol No.	Parts Location
C	
C2851	3A
C2852	2B
C2853	2B
C2854	2B
C2855	2B
C2856	1B
C2857	1B
C2858	1B
C2859	1A
C2860	1A
C2861	1A
C2865	1A
C2870	1A
C2872	1A
D	
D2851	3B
D2852	2B
D2853	2B
D2854	3B
IC	
IC2851	1A
IC2852	2B
PG	
PG2851	3A
PG2852	2A
PG2853	3A
Q	
Q2851	2B
Q2863	1A
R	
R1884	1A
R2851	2B
R2852	2B
R2859	1A
R2860	1A
R2868	1A
R2869	1A
R2870	1A
ZD	
ZD2851	2B
ZD2858	1A

PRE, PTR, PUR, ECA CIRCUIT BOARD

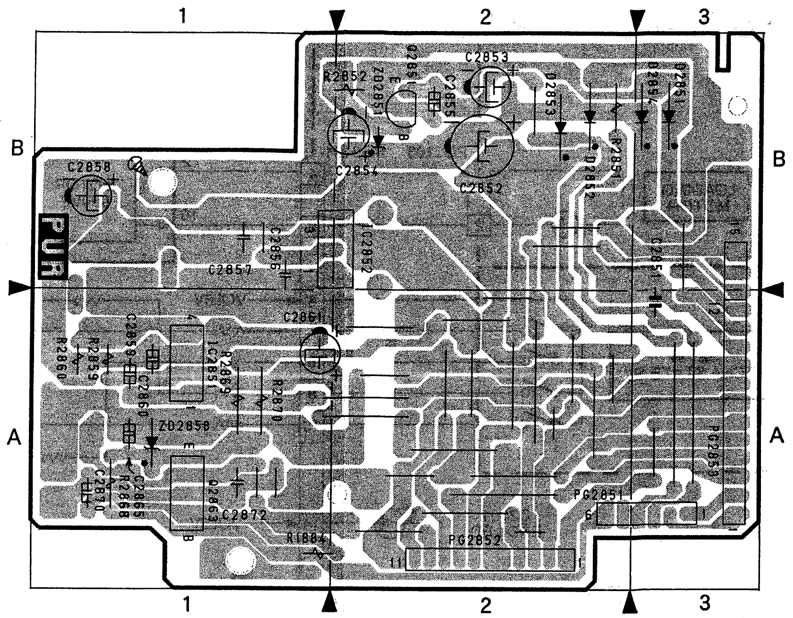


1
2
3
4
5
B
A
PG0003
PG0002
PG0001
IC0001
D8005
C0023
C0021
C0017

PRE [PRE/REC AMP] —SIDE A—

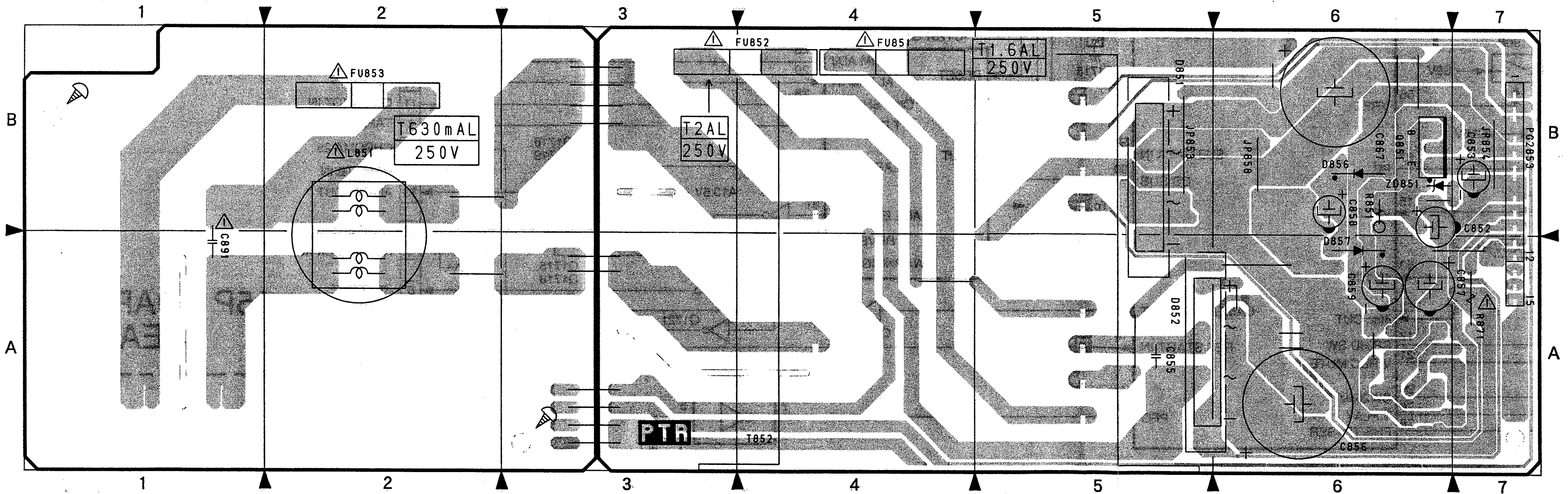


PRE [PRE/REC AMP] —SIDE B—
[PATTERN No. JA1240-3]



1
2
3
B
A
PUR
C2858
C2853
C2852
C2857
PG2851
PG2852
R1884

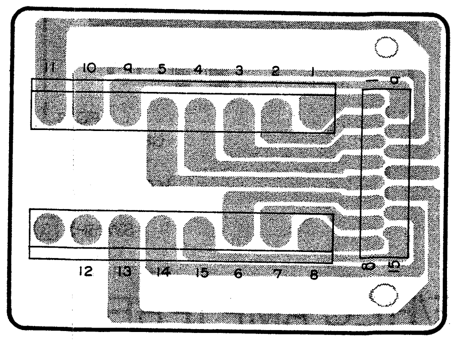
PUR [REGULATOR]
[PATTERN No. JK1414-1]



1
2
3
4
5
6
7
B
A
FU853
T630mAL
250V
L851
C891
FU852
FU851
T2AL
250V
T1.6AL
250V
D851
D852
JP853
JP858
PG2853
C852
C855
T852
PTR

NOTE:ADD 1000 TO ALL CIRCUIT NUMBERS IN
POWER TRANS SECTION(EXCEPT T&FU)
(FOR EXAMPLE READ R851 IS R1851 IN PARTS LIST.)

PTR [POWER TRANS]
[PATTERN No. JK1414-1]

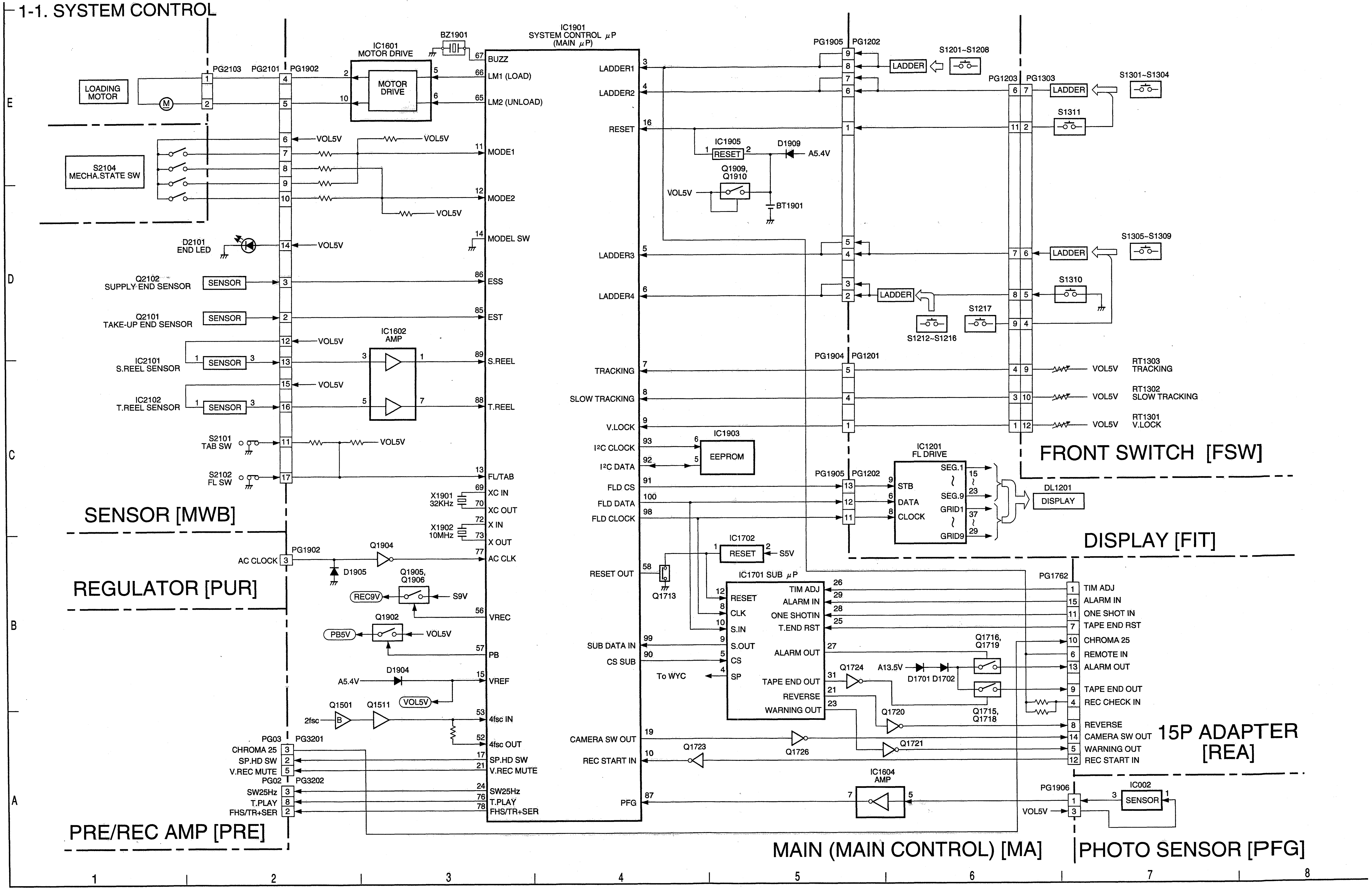


11
10
9
5
4
3
2
1
12
13
14
15
6
7
8

ECA [15PADAPTER]
[PATTERN No. 150583-4]

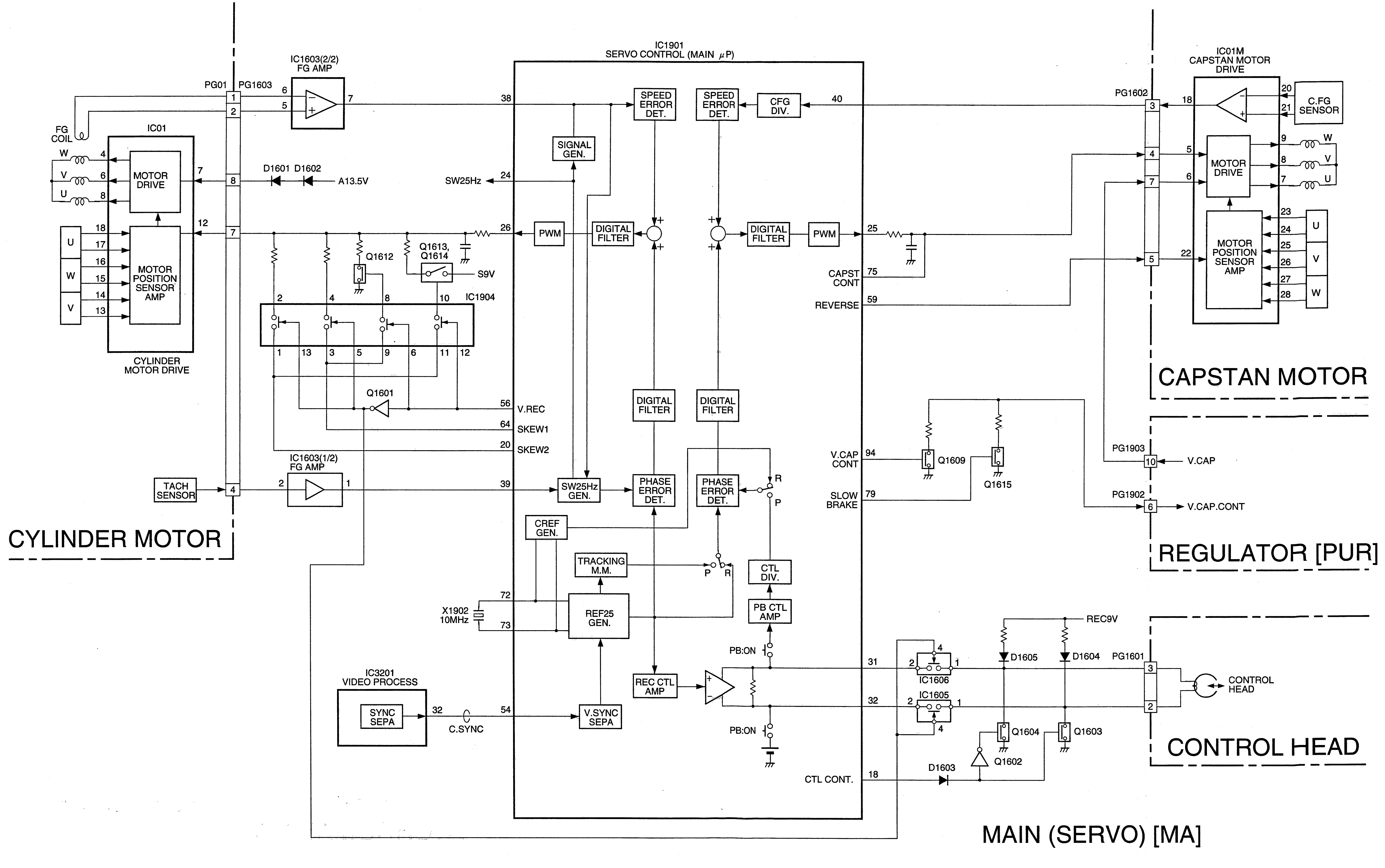
2. BLOCK DIAGRAM

1-1. SYSTEM CONTROL

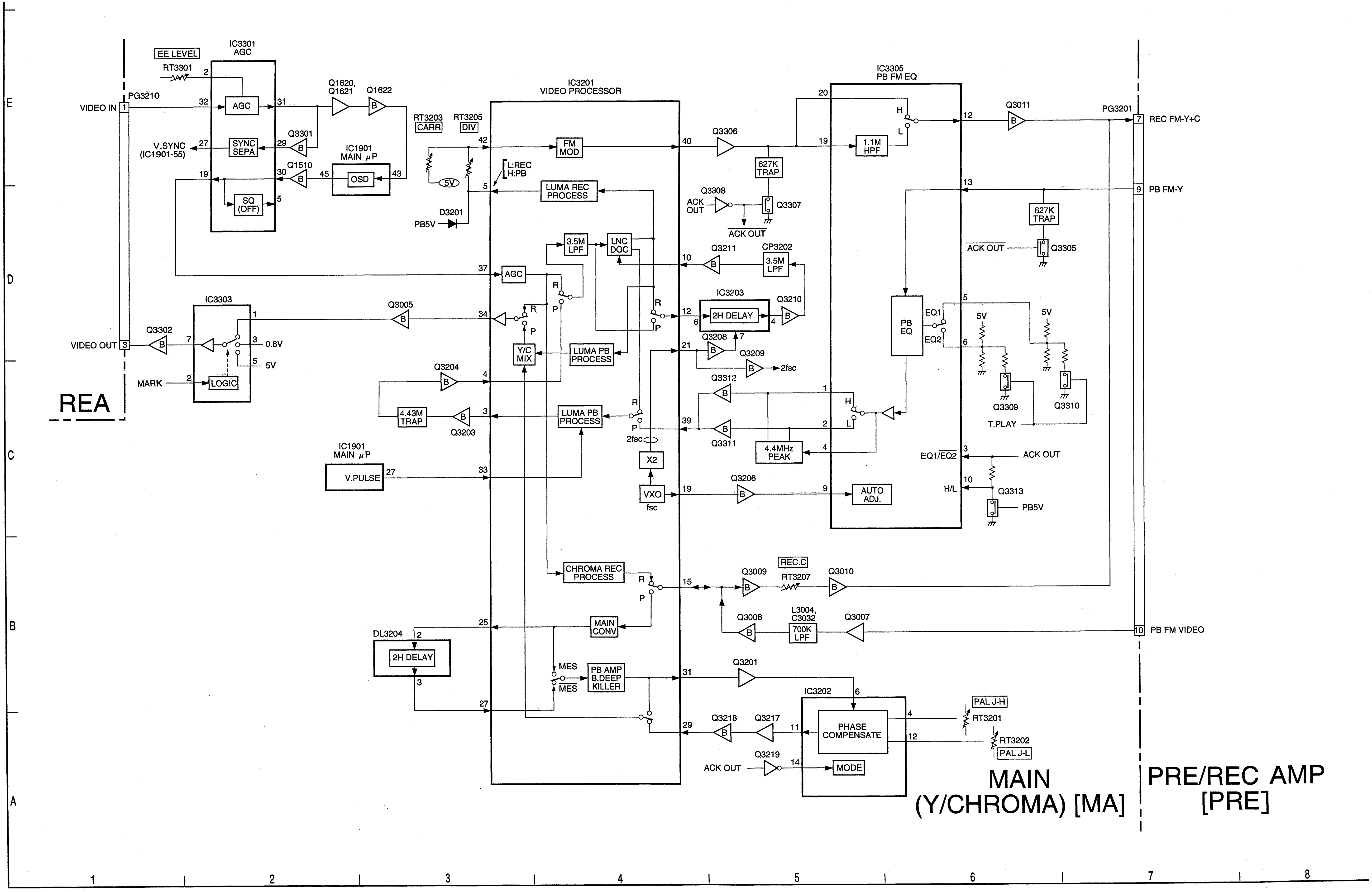


LOADING MOTOR
PG2103
PG2101
PG1902
S2104 MECHA.STATE SW
D2101 END LED
Q2102 SUPPLY END SENSOR
Q2101 TAKE-UP END SENSOR
IC2101 S.REEL SENSOR
IC2102 T.REEL SENSOR
S2101 TAB SW
S2102 FL SW
SENSOR
VOL5V
IC1601 MOTOR DRIVE
MOTOR DRIVE
BZ1901
IC1602 AMP
X1901 32KHz
X1902 10MHz
IC1901 SYSTEM CONTROL µP (MAIN µP)
BUZZ
LM1 (LOAD)
LM2 (UNLOAD)
MODE1
MODE2
MODEL SW
ESS
EST
S.REEL
T.REEL
FL/TAB
XC IN
XC OUT
X IN
X OUT
AC CLK
VREC
PB
VREF
4fsc IN
4fsc OUT
SP.HD SW
V.REC MUTE
SW25Hz
T.PLAY
FHS/TR+SER
LADDER1
LADDER2
RESET
LADDER3
LADDER4
TRACKING
SLOW TRACKING
V.LOCK
I²C CLOCK
I²C DATA
FLD CS
FLD DATA
FLD CLOCK
RESET OUT
SUB DATA IN
CS SUB
CAMERA SW OUT
REC START IN
PFG
SENSOR [MWB]
AC CLOCK
Q1904
D1905
Q1905, Q1906
REC9V
S9V
Q1902
PB5V
D1904
A5.4V
Q1501
Q1511
2fsc
REGULATOR [PUR]
PG03
PG3201
CHROMA 25
SP.HD SW
V.REC MUTE
PG02
PG3202
SW25Hz
T.PLAY
FHS/TR+SER
PRE/REC AMP [PRE]
IC1905
RESET
D1909
Q1909, Q1910
BT1901
IC1903
EEPROM
IC1702
S5V
Q1713
IC1701 SUB µP
TIM ADJ
ALARM IN
ONE SHOTIN
T.END RST
S.IN
S.OUT
CS
SP
CLK
ALARM OUT
TAPE END OUT
REVERSE
WARNING OUT
To WYC
Q1724
A13.5V
D1701 D1702
Q1716, Q1719
Q1715, Q1718
Q1720
Q1721
Q1726
Q1723
IC1604 AMP
PG1905
PG1202
S1201~S1208
LADDER
PG1203
PG1303
S1301~S1304
S1311
S1305~S1309
S1310
S1217
S1212~S1216
PG1904
PG1201
RT1303 TRACKING
RT1302 SLOW TRACKING
RT1301 V.LOCK
FRONT SWITCH [FSW]
IC1201 FL DRIVE
STB
DATA
CLOCK
SEG.1
SEG.9
GRID1
GRID9
DL1201
DISPLAY
DISPLAY [FIT]
PG1762
TIM ADJ
ALARM IN
ONE SHOT IN
TAPE END RST
CHROMA 25
REMOTE IN
ALARM OUT
TAPE END OUT
REC CHECK IN
REVERSE
CAMERA SW OUT
WARNING OUT
REC START IN
15P ADAPTER [REA]
PG1906
IC002
SENSOR
MAIN (MAIN CONTROL) [MA]
PHOTO SENSOR [PFG]
E
D
C
B
A
1
2
3
4
5
6
7
8

1-2. SERVO

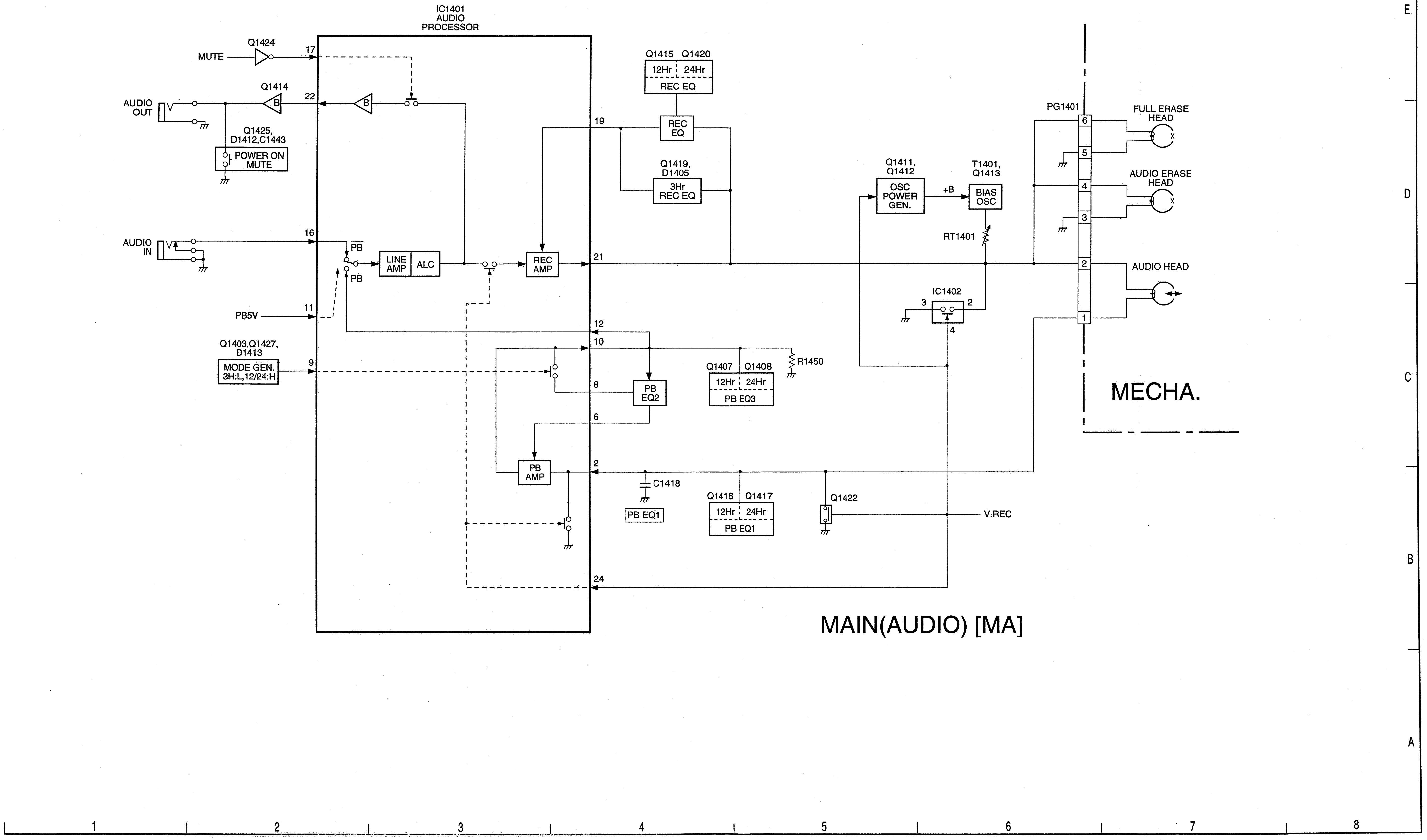

IC1901
SERVO CONTROL (MAIN µP)
IC1603(2/2)
FG AMP
PG01
PG1603
FG COIL
IC01
MOTOR DRIVE
MOTOR POSITION SENSOR AMP
CYLINDER MOTOR DRIVE
U
W
V
D1601
D1602
A13.5V
SW25Hz
SIGNAL GEN.
SPEED ERROR DET.
CFG DIV.
PWM
DIGITAL FILTER
Q1612
Q1613, Q1614
S9V
IC1904
Q1601
V.REC
SKEW1
SKEW2
IC1603(1/2)
FG AMP
TACH SENSOR
SW25Hz GEN.
PHASE ERROR DET.
CREF GEN.
TRACKING M.M.
CTL DIV.
PB CTL AMP
X1902
10MHz
REF25 GEN.
REC CTL AMP
PB:ON
IC3201
VIDEO PROCESS
SYNC SEPA
C.SYNC
V.SYNC SEPA
CYLINDER MOTOR
CAPST CONT
REVERSE
V.CAP CONT
SLOW BRAKE
CTL CONT.
Q1609
Q1615
IC1606
IC1605
D1605
D1604
REC9V
Q1604
Q1603
Q1602
D1603
IC01M
CAPSTAN MOTOR DRIVE
PG1602
C.FG SENSOR
CAPSTAN MOTOR
PG1903
V.CAP
PG1902
V.CAP.CONT
REGULATOR [PUR]
PG1601
CONTROL HEAD
MAIN (SERVO) [MA]
R
P

1-3. VIDEO



REA
PG3210
VIDEO IN
VIDEO OUT
EE LEVEL
RT3301
IC3301
AGC
SYNC SEPA
SQ (OFF)
V.SYNC (IC1901-55)
Q1620, Q1621
Q1622
Q3301
Q1510
IC1901 MAIN μP
OSD
IC3303
LOGIC
MARK
Q3302
0.8V
5V
RT3203 CARR
RT3205 DIV
5V
D3201
PB5V
L:REC H:PB
IC3201 VIDEO PROCESSOR
FM MOD
LUMA REC PROCESS
3.5M LPF
LNC DOC
AGC
Y/C MIX
LUMA PB PROCESS
4.43M TRAP
Q3005
Q3204
Q3203
IC1901 MAIN μP
V.PULSE
2fsc
X2
VXO
fsc
CHROMA REC PROCESS
MAIN CONV
PB AMP B.DEEP KILLER
MES
DL3204
2H DELAY
Q3306
627K TRAP
Q3308
ACK OUT
Q3307
Q3211
CP3202
3.5M LPF
IC3203
2H DELAY
Q3210
Q3208
Q3209
2fsc
Q3312
Q3311
4.4MHz PEAK
Q3206
REC.C
Q3009
RT3207
Q3010
Q3008
L3004, C3032
700K LPF
Q3007
Q3201
IC3202
PHASE COMPENSATE
MODE
Q3218
Q3217
Q3219
ACK OUT
PAL J-H
RT3201
RT3202
PAL J-L
IC3305 PB FM EQ
1.1M HPF
PB EQ
EQ1
EQ2
AUTO ADJ.
EQ1/EQ2
H/L
Q3011
627K TRAP
ACK OUT
Q3305
Q3309
Q3310
T.PLAY
ACK OUT
Q3313
PB5V
PG3201
REC FM-Y+C
PB FM-Y
PB FM VIDEO
MAIN (Y/CHROMA) [MA]
PRE/REC AMP [PRE]
E
D
C
B
A
1
2
3
4
5
6
7
8

1-4. AUDIO


IC1401
AUDIO
PROCESSOR
MUTE
Q1424
17
AUDIO
OUT
Q1414
22
B
B
Q1425,
D1412,C1443
POWER ON
MUTE
AUDIO
IN
16
PB
PB
LINE
AMP
ALC
REC
AMP
PB5V
11
Q1403,Q1427,
D1413
MODE GEN.
3H:L,12/24:H
9
Q1415
Q1420
12Hr
24Hr
REC EQ
19
REC
EQ
Q1419,
D1405
3Hr
REC EQ
21
12
10
8
PB
EQ2
6
PB
AMP
2
24
R1450
Q1407
Q1408
12Hr
24Hr
PB EQ3
C1418
PB EQ1
Q1418
Q1417
12Hr
24Hr
PB EQ1
Q1422
V.REC
Q1411,
Q1412
OSC
POWER
GEN.
+B
T1401,
Q1413
BIAS
OSC
RT1401
IC1402
3
2
4
PG1401
6
5
4
3
2
1
FULL ERASE
HEAD
AUDIO ERASE
HEAD
AUDIO HEAD
MECHA.
MAIN(AUDIO) [MA]
E
D
C
B
A
1
2
3
4
5
6
7
8

MICROPROCESSOR PIN FUNCTION TABLES

1-1. SUB µP (IC1701)

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	–	–	Unused
2	O	–	–	Unused
3	O	–	–	Unused
4	O		–	Unused
5	I	PULSE	CE	Chip enable signal for microprocessor communications
6	I	–	–	Unused
7	I	–	–	Unused
8	I	PULSE	CLK	Common communication lines with SYS.CON microprocessor; data is communicated and synchronized with the CLOCK signal.
9	O	PULSE	S DATA OUT	
10	I	PULSE	S DATA IN	
11	I	–	ALARM IN	Unused
12	I	L	RESET	Reset with "L" input.
13	I	–	CNVSS	Ground.
14	O	–	XOUT	System clock generator input/output
15	I	–	XIN	
16	–	–	VSS	Ground.
17	–	–	VDD	Power supply.
18	–	–	VREF	Reference voltage input.
19	–	–	AVSS	Ground.
20	I	–	–	Unused.
21	O	H	REVERSE	Reverse mode control output. Drives the capstan motor in reverse.
22	O	–	–	Unused.
23	O	H	WARNING OUT	Outputs "L" when an abnormality is detected.
24	I/O	–	–	Unused.
25	I/O	L	TAPE END RST	TAPE END OUT stops with "L" input.
26	I/O	PULSE	TIME ADJ	Time adjustment input.
27	O	H	ALARM OUT	Outputs "H" during alarm recording.
28	I	–	ONE SHOT IN	One-shot recording start input.
29	I	L	ALARM B IN	The "L" input starts alarm recording.
30	O	–	–	Unused.
31	O	H	TAPE END OUT	Outputs "H" when tape end is detected.
32	O	–	–	Unused.

1-2. MAIN µP (IC1901) Pin Function Table

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	–	CS TDS/232C	Unused.
2	–	–	GND	
3	I	A/D	LADDER 1	Key matrix input
4	I	A/D	LADDER 2	Key matrix input
5	I	A/D	LADDER 3	Key matrix input
6	I	A/D	LADDER 4	Key matrix input
7	I	A/D	TRACKING	Tracking voltage input during playback
8	I	A/D	SLOW TRACKING	Tracking voltage input during frame advance play
9	I	A/D	V. LOCK	Vertical jitter adjustment voltage input during still play
10	I	L	REC START IN	Recording is started with "L" input.
11	I	A/D	MODE 1	Mechanism state position detection inputs to control the loading motor.
12	I	A/D	MODE 2	

Posi-tion	1 FL	2 UL	3 S-REW	4 STP2	5 FF/REW	6 R/P	7 FS	8 RFS	9 REV	0 TRANS
MODE 1	1.80	1.80	2.50	0.00	0.00	1.80	1.80	0.00	2.50	0.00 V
MODE 2	0.00	2.50	0.00	3.05	1.80	1.80	3.05	2.50	2.50	0.00 V

Pin No.	I/O	Active Level	Abbreviation	Function
13	I	A/D	FL/TAB	Input to detect cassette position and erase prevention tab. "H": With tab, "L": Cassette being loaded/ejected, "M": Without tab
14	I	A/D	MODEL SW	GND
15	I	–	VREF	A/D converter reference voltage (5V)
16	I	L	RESET	Initialized with "L" input.
17	O	PULSE	SP. HD SW	DA4-head switching signal
18	O	H	CTL. CONT	CTL timing output during recording.
19	O	PULSE	CAMERA SW OUT	Outputs timing pulses that switch recording and camera when an auto switcher is connected.
20	I/O	PULSE	DM ADJ/SKEW 2	Skew correction signal during time-lapse recording. Horizontal jitter correction signal during frame advance play
21	O	H	V REC. MUTE	Mutes video signal recording. "H": Mutes video signal, "L": Releases muting. Stops signal supply to video heads.
22	I	–	VCC	Connected to back-up power supply.
23	O	–	2H. DLY	Unused
24	O	PULSE	SW25	Head switching SW25 pulse
25	O	PWM	CAM PWM	PWM output for capstan motor control
26	O	PWM	DRUM PWM	PWM output for cylinder motor control
27	O	H/M/L	V. PULSE	Artificial V sync pulse output ("H": SYNC, "M": Pedestal, "L": VIDEO through)
28	O	–	C. ROTARY	Unused
29	O	–	H. AMP SW	Unused
30	I	–	COMP	Unused
31	I/O	PULSE	CTL H (+)	CTL pulse input/output
32	I/O	PULSE	CTL H (–)	CTL pulse input/output
33		–	Vss (SRV)	GND
34	I	PULSE	CTL AMP I1	For external connection of CTL amp
35	I	PULSE	CTL AMP I2	For external connection of CTL amp
36	I	PULSE	CTL AMP I3	For external connection of CTL amp
37	O	PULSE	CTL AMP (0)	CTL amp output
38	I	PULSE	DRUM FG	Cylinder FG pulse input for cylinder speed control
39	I	PULSE	DRUM PG	Cylinder TAC pulse input for cylinder phase control
40	I	PULSE	CFG	Capstan FG pulse input for capstan motor control
41	I	–	Vcc (SRV)	5V input
42	I	–	Vcc (OSD)	5V input
43	I		CV IN	Video signal input
44	I	–	Vref	Reference bias, clamp bias monitor terminal
45	O	–	CV OUT	Video signal output. OSD is superimposed.
46	I	–	CHAR Bias	Character luminance level external adjustment (unused)
47	I	–	AFC LPF	For the connection of LPF of AFC
48	I	–	AFC OSC	Oscillator for AFC
49	I	–	GND (OSC)	Ground
50	I	–	DOSC IN	OSD dot clock oscillator input

Pin No.	I/O	Active Level	Abbreviation	Function
51	O	–	DOSC OUT	OSD dot clock oscillator output
52	O	–	4fsc OUT	2fsc oscillator output
53	I	–	4fsc IN	2fsc oscillator input
54	I	PULSE	C. SYNC	Composite sync signal input for video output
55	I	H	V. SYNC	Detects whether input signal is present or not. With input: "H", Without input: "L"
56	O	H	REC	Video signal recording control. REC: "H"
57	O	L	PB	Sets video system to playback mode. PB: "L"
58	O	H	RESET OUT	Microprocessor reset output (When reset: "H", Other: "L")
59	O	H	REVERSE	Capstan motor reverse control output (Reverse: "H", Other: "L")
60	O	H	48Hr	Audio muting signal during frame advance
61	O	H	24/30Hr	Switches audio equalizer between 24 and 30Hr modes.
62	O	H	12/18Hr	Switches audio equalizer between 12 and 18Hr modes.
63	I/O	H/M/L	CLR/BW/AUTO	Color/monochrome/AUTO switching. Monochrome: "H", AUTO: "M", Color: "L"
64	I/O	H	DM ADJ/SKEW 1	Skew correction signal during time-lapse recording. Horizontal jitter correction signal during frame advance play
65	O	H	LM 2 (UNLOAD)	Loading motor control output (unloading)
66	O	H	LM 1 (LOAD)	Loading motor control output (loading)
67	O	PULSE	BUZZ	Buzzer output.
68		–	TEST	Ground
69	I	–	XCIN	These pins generate a 32.768 kHz clock signal for the clock.
70	O	–	XCOUT	
71	I	–	GND	Ground
72	I	–	XIN	These pins generate a 10 MHz system clock signal in modes other than backup.
73	O	–	XOUT	
74	O	L	L. MUTE	Audio output muting control. Mute ON: "L"
75	O	H/L	CAPS CONT	Voltage control: "H", Servo control: "OPEN", Stop: "L"
76	O	H	T. PLAY	Special-effect playback output signal. During special-effect playback: "H"
77	I	PULSE	AC CLK	Reference signal for clock (NTSC), power failure detection signal (NTSC, PAL)
78	I/O	H/M/L	FHS/TR+SER	Transient, search signal. Search: "H", Still:"M" (input)
79	O	H	SLOW BRAKE	Frame advance recording/playback capstan voltage control
80	O	–	IRRDPG	Test pin. To make sure of cylinder FG input.
81	O	–	SSB DATA (F SW CONT 2)	Unused
82	O	–	NARROW (F SW CONT 3)	Unused
83	O	–	IRRCTL	Test pin. To make sure of CTL input.
84	O	–	IRRCFG	Test pin. To make sure of capstan FG input.
85	I	L	EST	If "L" is input from sensors on the mechanism, the current mode is released. Both sensors detect each tape end: If "L" is input from both sensors, detection decision is that a cassette has not been inserted.
86	I	L	ESS	
87	I	PULSE	PFG	The capstan rotation sensor detection signal is input during recording.
88	I	PULSE	T. REEL	The period of take-up reel pulse is measured to detect whether slack tape has been taken up: If not, the mechanism will stop. Supply reel pulses are used with take-up reel pulses to calculate the remaining tape time in the FF/REW modes.
89	I	PULSE	S. REEL	
90	O	PULSE	CS SUB	Chip select to the sub-microprocessor
91	O	PULSE	FLD CS	Chip select to the fluorescent display driver (FLD)
92	I/O	PULSE	12C DATA	12C communication data signal
93	O	PULSE	12C CLOCK	12C communication clock signal
94	O	H/L	V. CAP. CONT	Sets the voltage of the capstan motor in the PB, FF/REW and SLOW modes.
95	O	–	CLK	Unused
96	I	–	S DATA IN	Unused
97	O	–	S DATA OUT	Unused
98	O	PULSE	FLD CLOCK	Clock for serial data output to sub-microprocessor and FLD.
99	I	PULSE	SUB DATA IN	Data input signal from sub-microprocessor.
100	O	PULSE	FLD DATA	Serial data to sub-microprocessor and FLD.

HITACHI

SERVICE MANUAL

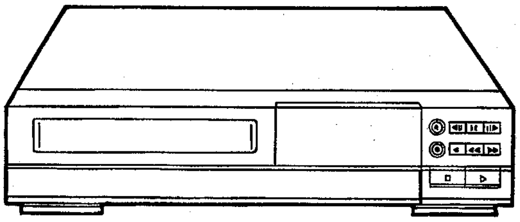
TK

No.8609E

VT-L1100E

AF MECHANISM

This model uses a AF Mechanism. Refer to the following manuals for the AF Mechanism.



Manual to be referred

Name of manual	Manual No.
AF Mechanism	4412E

V17743

VHS

This video desk is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

November 1996 Image & Information Media Systems Division, Tokai

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

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◆ AFmechanism edition (No.4412E)
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The AF mechanism is used as the mechanical block of this VCR. Refer to the following manual when dismantling the mechanical section
◆ AFmechanism edition (No.4412E)
"CHAPTER 2 MECHANISM ADJUSTMENT"
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CHAPTER 1 GENERAL INFORMATION

1. SPECIFICATIONS

Video Cassette :	VHS type
Recording :	Rotary two-head helical scan azimuth recording
Tape Speed :	23.39mm/sec. (03 mode)
Tape Width :	12.7mm
Operation Temperature :	5℃ to 40℃
Video :	PAL colour (system I) & CCIR monochrome signals (625lines)
Recording Lengths :	03,12,24
Video Input :	1Vp-p 75ohm unbalanced (BNC)
Video Output :	1Vp-p 75ohm unbalanced (BNC)
S/N Ratio (Video) :	More than 42 dB (03 mode)
S/N Ratio (Audio) :	More than 40 dB (03 mode)
Horizontal Resolution :	Colour : 240 lines (03 mode) Monochrome : 350 lines (03 mode)
Audio Input :	-8dBm 50 kohm unbalanced
Audio Output :	-10dBm 600 ohm unbalanced
Audio Frequency Range :	100 Hz to 8 kHz (03 mode)
Power :	AC 230V,50Hz
Power Consumption :	23W
Cabinet Size :	435mm (W) × 94mm (H) × 366mm (D)
Weight :	6.2kg

*Design and specifications are subject to change without notice.

2. COMPARISON OF FEATURES

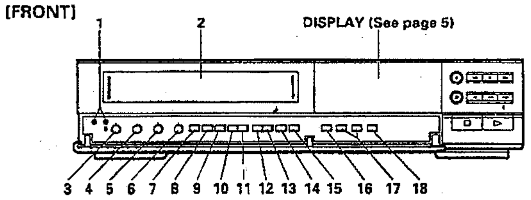
← : Same as left

	ITEM	VT-L1100E	VT-L2500E
FEATURE	FORMAT	VHS	←
	OSD	YES	←
	VIDEO REC MODE	03/12/24	03/12/24/48/72/120/168/240/360/480/600/720
	VIDEO PLAY MODE	02/A12/A24/24	03/A12/A24/24/48/72/120/168/240/360/480/600/720
	AUDIO REC MODE	03/12/24	←
	AUDIO PLAY MODE	03/A12/A24	←
	REVERSE PLAY	YES (1MIN)	←
	F ADVANCE	YES	←
	REVERSE F. ADVANCE	YES	←
	FINE STILL	YES	←
	REC CHECK	YES	←
	TIMER REC PROGRAM	7 PRO/WEEK, 2 PRO/DAY	←
	ALARM REC MODE	03/12/24	←
	ALARM REC TERM	5SEC/15SEC/30SEC/1MIN/3MIN/MANUAL	←
	ONE SHOT REC	NO	YES (2/4/6/8 FIELD)
	MEMORY BACK UP TIME	720 Hr	←
	TAPE SPEED DISPLAY	YES	←
	MODE LOCK	YES	←
	VERSION DISPLAY	NO	←
	BUZZER	NO	←
INPUT/OUTPUT TERMINAL	TROUBLE MODE	YES	←
	VIDEO INPUT/OUTPUT	BNC 1 SYSTEM	←
	AUDIO INPUT/OUTPUT	US 1 SYSTEM	←
	INTERFACE (RS-232C) CONNECTOR	NO	YES (25pin)
	15 PIN PLUG 1	ALARM IN	←
	2	ALARM OUT	←
	3	ALARM REC RESET	ONE SHOT IN
	4	TAPE END OUT	←
	5	TAPE END RESET	←
	6	NC	WARING OUT
	7	NC	←
	8	NC	TIME ADJ
	9	CAMERA SW OUT	←
	10	REC START IN	←
	11	GND	CHROMA 25
	12	NC	REVERSE
	13	REMOTE IN	←
	14	NC	REC CHECK IN
	15	GND	←
CHASSIS	BASIC	AF	←
	VIDEO HEADS	DA 4HEAD SP . 57/57 μ m	←
	AUTO HEADS CLEANING	YES	←
	REWIND TIME	E-180 · 2. 5MIN	←

3.OPERATION

CONTROLS AND FUNCTIONS

[FRONT]



1. **RESET BUTTONS**
   Press these buttons at the same time to clear all (microprocessor) functions.
   Press the "S" button to reset the system. (This does not erase the stored information.)

2. **CASSETTE COMPARTMENT**

3. **SHARPNESS CONTROL**
   Adjust the picture quality to hard or soft during playback.

4. **TRACKING CONTROL**
   Adjust to optimize the picture quality during playback at the 03, A12 and A24 hour speeds.

5. **SLOW TRACKING CONTROL**
   Adjust to optimize the picture quality in the SLOW PLAY mode, e.g. 24 hours speed.

6. **V. LOCK CONTROL**
   Reduces vertical jitter in the still play mode.

7. **PROGRAM BUTTON**
   Press to select one of the six programmable functions.

8. **START/STOP BUTTON**
   Press to start or stop the programming of a programmable function. (Press once to start the programming sequence and a second time to stop (end) it.)

9. **SET BUTTON**
   Press to select the specific value which is to be changed with the UP/DOWN buttons.

10. **DOWN BUTTON**
    Press to decrement, change or reverse to the previous/lower value.

11. **UP BUTTON**
    Press to increase, change or advance to the next higher value.

12. **V-POS (VERTICAL POSITION) BUTTON**
    Press repeatedly to control the vertical position of the programmable display on the monitor.

13. **H-POS (HORIZONTAL POSITION) BUTTON**
    Press repeatedly to control the horizontal position of the programmable display on the monitor.

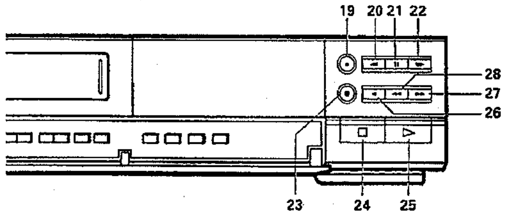
14. **ALARM INDEX BUTTON**
    Press this button to cause the INDEX indicator to light, and set the VCR to the visual search mode (press F.FWD or REWIND during playback mode) in this state; the start of the alarm recorded can be located.

15. **ALARM RESET BUTTON**
    Press to clear POWER LOSS information. When this button is pressed when the Alarm Memory screen is being displayed, the alarm memory is cleared.

16. **COUNTER RESET BUTTON**
    Press to clear the digital counter to "0000"

17. **REC/PLAY HOURS BUTTONS**
    ▲ (UP): Press to increase hours to the next higher value.
    ▼ (DOWN): Press to decrease hours to the next lower value. The tape speed will be indicated as part of the monitor display.

18. **TIMER BUTTON**
    Press after programming the TIMER for automatic TIMER recording. See page 11 for TIMER programming.



19. **EJECT BUTTON**
    Press to remove the cassette. The EJECT button will not operate in the RECORD mode.

20. **FIELD REVERSE BUTTON**
    Press to reverse the tape by one field in the STILL playback mode.

21. **STILL BUTTON**
    Press to momentarily stop tape motion in the play mode. The STILL function allows close inspection of individual scenes. See the description of STILL playback on page 17.

22. **FIELD ADVANCE BUTTON**
    Press to advance the tape one field in the STILL playback mode.

23. **RECORD BUTTON**
    Press to start recording.

24. **STOP BUTTON**
    Press to stop the tape. The STOP button must be pressed to end the RECORD and PLAY mode.

25. **PLAY BUTTON**
    Press to play recorded material in the forward direction. Pressing this during recording makes it possible to check recordings.

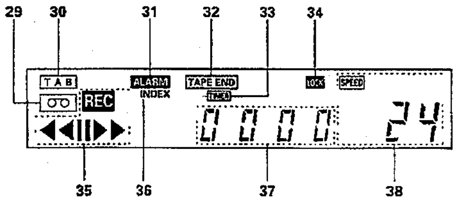
26. **REVERSE PLAY BUTTON**
    Press to play recorded material at the 03 speed in the reverse direction during the PLAY mode.

27. **FAST FORWARD/VISUAL SEARCH BUTTON**
    Press to activate fast forward.
    Press this button during playback and a forward playback picture at high speed can be seen.

28. **REWIND/VISUAL SEARCH BUTTON**
    Press to start rewind.
    Press this button during playback and a reverse playback picture at high speed can be seen.

CONTROLS AND FUNCTIONS (Continued)

[DISPLAY]



29. **TAPE-IN INDICATOR**
    Lights when a cassette is in the compartment.

30. **TAB INDICATOR**
    Lights when a cassette without its safety tab is loaded.

31. **ALARM INDICATOR**
    ALARM appears during alarm recording.
    ALARM flashes when alarm recording ends.

32. **TAPE END INDICATOR**
    Lights when the tape reaches the end during recording.
    Note: "TAPE END" is not displayed when you have selected REW, RE-REC in the "RECYCLE FUNCTIONS" menu in the alarm display or you have selected REWIND, STOP IF ALARM but an alarm recording has not been made.

33. **TIMER INDICATOR**
    This is lit during timer recording or TIMER stand-by mode.
    The indicator flashes in the following cases.
    - A cassette is not loaded.
    - A cassette without its safety tab is loaded.
    - The timer has not been programmed.

34. **LOCK INDICATOR**
    LOCK appears when the recorder is in the security lock mode.

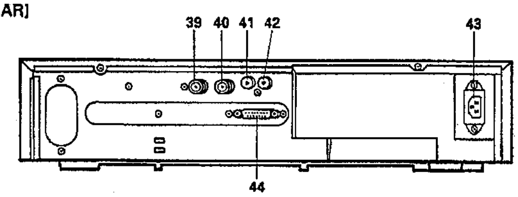
35. **VCR MODE INDICATORS**
    - REC appears during recording.
    - ◀◀ appears during the rewind mode.
    - ▶▶ appears during the fast forward mode.
      ◀◀ (or ▶▶) flashes during visual search.
      ▶ appears during the playback mode.
      ◀ appears during the reverse play mode.
    - II appears when the STILL button is pressed during play mode and disappears when the STILL or PLAY button is pressed again.
    - ◀II (or II▶) appears while the FIELD REV (or FIELD ADV) is held depressed in the still playback mode.
      Note: Still playback is restored when the FIELD REV (or FIELD ADV) button is released.

36. **INDEX INDICATOR**
    INDEX appears when the ALARM INDEX button is pressed.
    INDEX disappears when the ALARM INDEX button is pressed again.
    INDEX flashes during alarm indexing.

37. **DIGITAL COUNTER**
    Shows the tape counter. The counter does not count during non-recorded sections of a tape.

38. **TAPE SPEED INDICATOR**
    Shows the tape speed.

[REAR]



39. **VIDEO IN**
    Receives video signal from a video camera or another VCR.

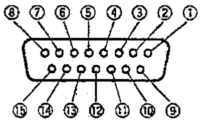
40. **VIDEO OUT**
    For connection to monitor.

41. **AUDIO IN**
    Accepts an audio signal from a camera, external sound equipment or another recorder (Line: –8 dBm, 50 Kohm, unbalanced).

42. **AUDIO OUT**
    Provides an audio output for a monitor or another recorder (–10 dBm, 600 ohm, unbalanced).

43. **AC INLET**

44. **EXTERNAL INTERFACE (15-PIN) JACK**
    Connect an alarm switch, door sensor, etc. using the 15-pin adapter provided.



① ALARM IN
② ALARM OUT
③ ALARM REC RESET
④ TAPE END OUT
⑤ TAPE END RESET
⑥ —
⑦ —
⑧ —
⑨ CAMERA SW OUT
⑩ REC START IN
⑪ GND
⑫ —
⑬ —
⑭ —
⑮ GND

INSTALLATION

VIDEO CONNECTIONS
Use coaxial cables when connecting a camera and a monitor to this VCR.

Note: Long cable runs to distant cameras may cause signal deterioration and/or sync discrepancies. If these problems occur, use video line amplifiers and/or cameras having phase-adjustable line-locked vertical sync.

Video Input
In single camera systems, connect the camera to the Video IN BNC terminal on the VCR rear panel. Use of a 2:1 interlace camera is highly recommended; otherwise, the monitor will show vertical distortion of the TIME/DATE characters.
In multiple camera systems, connect the switcher output to the Video IN BNC terminal. Because multiple camera systems require synchronization, use of cameras having line-locked vertical sync or a genlocked master drive/sync source is highly recommended. The use of vertical interval switchers is also recommended.

Video Output
Connect the monitor to the Video OUT BNC terminal on the rear panel.

AUDIO CONNECTIONS

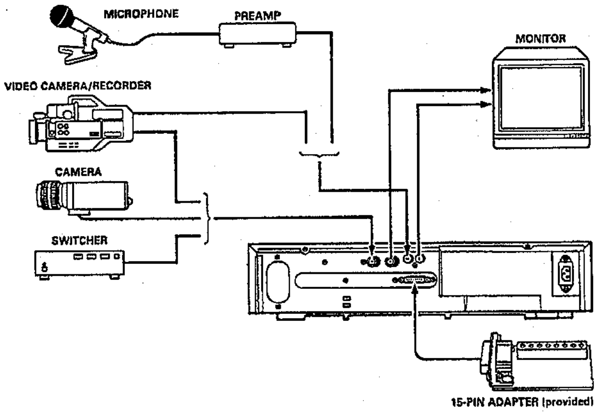
Note: Audio recording can be performed at the 03, 12 and 24-hour recording speeds and audio playback at the 03, A12, and A24 speeds.

Audio In: Accepts an audio signal from a camera, external sound equipment, or another recorder (Line: −8 dBm, 50 kohm).

Audio Out: Provides an audio output for a monitor or another recorder (−10 dBm, 600 ohm, unbalanced).

USING THE 15-PIN ADAPTER

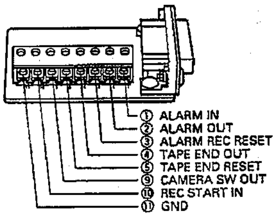
Attach the wires of the alarm switch, door sensor or warning lamp to the 15-pin adapter using screws.
After connection, connect the adapter to the EXTERNAL INTERFACE jack on the rear of the VCR.
See page 8 for details.



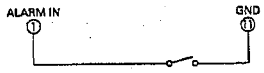
* It is necessary to connect to suit your purpose.

EXTERNAL CONNECTIONS

Pin Arrangement of 15-Pin Adapter



ALARM IN
You can connect an alarm switch with a resistance of 1 kohm or less or a door sensor. Connect pin ① to pin ⑪ (ground) through the switches.



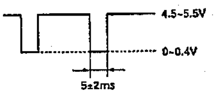
Note: Do not apply a voltage to pin ① or ⑪.

ALARM OUT
Approx. 12V is applied to pin ② during an alarm recording.
Notes:
- When you have selected "PULSE" in the "ALARM OUT" menu in the ALARM display, approx. 12V pulses will be applied to the output after the alarm recording ends.
- When you have selected "DURATION" in the "ALARM OUT" menu in the ALARM display, no voltage is applied after the alarm recording ends.
- The output impedance is approx. 100 ohm.

TAPE END OUT
Approx. 12V is applied to pin ④ when the tape reaches the end.
Notes:
- This does not operate when you have selected "REW, RE-REC" in the "RECYCLE FUNCTIONS" menu in the ALARM display or you have selected "REWIND, STOP IF ALARM" and no alarm recording has been made.
- The output impedance is approx. 100 ohm.

TAPE END RESET
The TAPE END OUT function can be turned off when pin ⑤ is shorted to pin ⑪.
Note: Do not apply a voltage to pin ⑤ or ⑪.

CAMERA SW OUT
Pin ⑨ outputs the following signal each time a one-field image is recorded. You can combine this with a video camera switcher which can be controlled externally.
The output timing can be specified using the SELECTION MENU screen.



REC START IN
Recording is started when 5-12V is applied to pin ⑩.

ALARM REC RESET
When pin ③ is shorted to pin ⑪ during alarm recording, alarm recording is stopped and the original mode be restored.

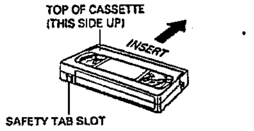
CASSETTE TAPES

TAPE LIFE
Slower speed operation in time lapse recording applies stress to video tape. Tapes should be inspected and, if necessary, discarded after the total number of complete tape passes (recording and playback) exceeds the following limits:

Tape Speed	Complete Tape Passes
03, 12, 24	50

INSERTING A CASSETTE

Note: This is the first step in all VCR operations. The VCR will not operate without a cassette in place. To insert a cassette push the cassette through the cassette compartment door until the VCR mechanism pulls it into the compartment.
The tape-in indicator turns on.



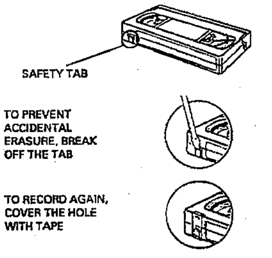
Tape Insertion Position

REMOVING A CASSETTE
Before removing a cassette, rewind the tape completely.
To remove a cassette, press the EJECT button. The cassette will come partially out of the compartment so you can pull it out.

VIDEO CASSETTE SAFETY TAB
To prevent accidental erasure of recorded material, remove the safety tab from the lower left corner of the cassette.

Recording is impossible when the safety tab is removed.

Notes:
- The TAB indicator lights when a cassette without its safety tab is loaded.
- To record again on a cassette that has its safety tab removed, cover the tab hole with tape. In the TIMER mode, the TIMER indicator will flash on and off if the cassette is inserted without its safety tab slot covered or intact.


SAFETY TAB
TO PREVENT ACCIDENTAL ERASURE, BREAK OFF THE TAB
TO RECORD AGAIN, COVER THE HOLE WITH TAPE

Video Cassette Safety Tab

TAPE LENGTH
The total recording time at each of the eleven tape speeds depends on the length of the tape used.
The table below shows:
1. The total recording time that can be recorded at each tape speed mode on E90 and E180 tapes.
2. The pictures per second at each speed.
3. The speeds at which audio can also be recorded.

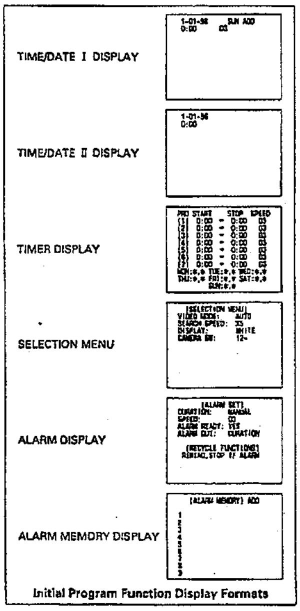
Use the table to select the tape length which gives the best compromise between tape cost, total recording time, and elapsed time between pictures.

Tape Speed Mode		03	12	24
Total Recording Hours	E90	1.5	7.5	13.5
	E180	3	15	27
Pictures/ Second	RECORD	50	10	5.6
	PLAYBACK	50	10	5.6
Audio	RECORD	Yes	Yes	Yes
	PLAYBACK	Yes	Yes	Yes

Note: The values in this table are approximate.

SETUP

On-Screen displays are provided to aid setup of the programmable functions. The six functions on the Program Menu appear individually on the monitor in this order.
1. TIME/DATE Ⅰ
2. TIME/DATE Ⅱ
3. TIMER
4. SELECTION MENU
5. ALARM
6. ALARM MEMORY



Initial Program Function Display Formats

Note: If the VCR is not turned on for about 720 hours after the built-in battery is fully charged (after the VCR is turned on for more than 48 hours), the TIME/DATE Ⅰ and Ⅱ displays will be cleared.

ESTABLISHING THE PROGRAM MODE
The TIME/DATE display appears on the monitor screen when the power cord is first plugged in.

SELECTING A FUNCTION TO BE PROGRAMMED
The program menu will always begin with the TIME/DATE Ⅰ function, followed by the TIME/DATE Ⅱ, TIMER, SELECTION MENU, ALARM, and then the ALARM MEMORY functions. Although the program menu always follows this order, it is possible to skip any of the available functions during the selection process.
To select the desired program function (and to move from one program function to the next), press the PROGRAM button repeatedly until the desired function display format appears on the monitor.
After the desired function has been selected, follow the corresponding procedure to set that function.

SETTING THE PROGRAM FUNCTION(S)
The first step in each programming procedure is: "Press the START/STOP button" The system allows up to five minutes for any one function setting to be completed after the START/STOP button is pushed. If no change/setting is entered within the five minutes period, the unit will automatically exit the selected program function and return the TIME/DATE display to the monitor. (If this happens, reselect the desired program function, and follow the programming procedure for that function.)

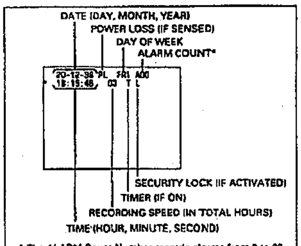
The following procedures for setting VCR functions assume that the desired function has already been selected.

Notes:
1. During programming, holding the SET, UP, or DOWN button will move/change the displayed information at a rapid rate.
2. The position of the TIME/DATE display on the monitor can be adjusted by using the H-POS and V-POS button on the front panel.

SETUP (Continued)

SETTING THE TIME AND DATE

To set the TIME/DATE I display



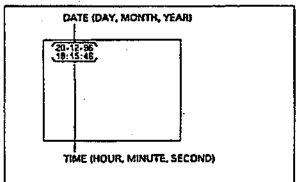
* The ALARM Count Number records alarms from 0 to 99 and then resets to 0 and continues counting.

TIME/DATE I Display Format Description

1. Press the START/STOP button. The day flashes on/off.
2. Press the UP or DOWN button until the desired number appears on the monitor.
3. Press the SET button. The month flashes on/off.
4. Press the UP or DOWN button until the desired number appears on the monitor.
5. Press the SET button. The year flashes on/off.
6. Press the UP or DOWN button until the desired number appears on the monitor.
7. Press the SET button. The day of week flashes on/off.
8. Press the UP or DOWN button until the desired day of week appears on the monitor.
9. Press the SET button. The hour flashes on/off.
10. Press the UP or DOWN button until the desired number appears on the monitor.
11. Press the SET button. The minutes flash on/off.
12. Press the UP or DOWN button until the desired number appears on the monitor.
13. Press the START/STOP button. The seconds are reset to 00.
    The TIME/DATE has been set.

Notes:
- Perform the same procedure as when setting the time and date to make corrections after having set them. The minutes flash on/off when the START/STOP button is pressed.
- To record time and date on the tape, display them on the monitor screen. If they are not displayed on the monitor, they cannot be recorded on the tape.

TIME/DATE II display



TIME/DATE II Display Format Description

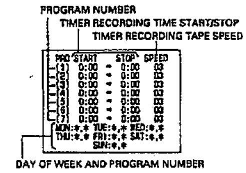
Select this function to display only the date and time on the monitor.
Note: The day of the week cannot be set in this display. Select the TIME/DATE I display to select the day of the week.

SUMMER TIME FUNCTION

Press the FIELD ADV and UP buttons simultaneously in the stop mode; the hour display will be counted up by one.
Press the FIELD ADV and DOWN buttons simultaneously to count the hour display down by one.
You can change the hour display in one-hour steps without any limit by pressing the above buttons.
Note: Summer time cannot be set unless TIME/DATE I or II is displayed or during the timer recording standby mode.

SETTING THE TIMER

To set the 24 Hour On/Off Timer function



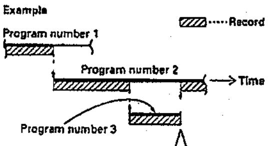
1: TIMER will record for the time set for PROGRAM NUMBER 1
2: TIMER will record for the time set for PROGRAM NUMBER 2
3: TIMER will record for the time set for PROGRAM NUMBER 3
4: TIMER will record for the time set for PROGRAM NUMBER 4
5: TIMER will record for the time set for PROGRAM NUMBER 5
6: TIMER will record for the time set for PROGRAM NUMBER 6
7: TIMER will record for the time set for PROGRAM NUMBER 7
*: No recording

TIMER Display Format Description

1. Press the START/STOP button.
   The program number (1) flashes on/off.
2. Press the SET button. The start hours flash on/off.
3. Press the UP or DOWN button until the desired number appears on the monitor.
4. Press the SET button. The start minutes flash on/off.
5. Press the UP or DOWN button until the desired number appears on the monitor.
6. Press the SET button. The stop hours flash on/off.
7. Repeat steps 3 through 5 to set the stop hours and minutes.
8. Press the SET button. The timer recording speed flashes on/off.
9. Press the UP or DOWN button until the desired number appears on the monitor.
10. Press the SET button after setting the timer recording speed. The program number of the next lower line flashes on/off.
11. Repeat steps 2 through 9 to set the program to the other program numbers.
12. Press the SET button after setting the program numbers (1) through (7).
    The two program event locations of MON flash on/off.
13. Press the SET button. The first program event location of MON flashes.
14. Press the UP or DOWN button until the desired program number appears on the monitor.
15. Press the SET button. The other program event location of MON flashes on/off.
16. Press the UP or DOWN button until the desired program number appears on the monitor.
    Notes:
    - If you do not need to timer record two events a day, mark either event with an asterisk (*).
    - If two asterisks are displayed, no timer recording is made on that day.
17. After setting two program event locations of MON, press the SET button. The two program event locations of the next day of the week flashes on/off.
18. Press the SET button. The first program event location of the next day flashes.
19. Repeat steps 12 through 16 to set the program event locations up to SUN.
20. Press the START/STOP button when the TIMER has been set.

Notes:
1. Programming the TIMER function does not activate it. See TIMER recording, page 16.
2. To record the time and date press the PROGRAM button to display them.
3. When the preset START time is later than the STOP time, the recording will be made into the following day.
4. When the START time and STOP time are the same, a recording will not be made.
5. When the programs for timer recording overlap each other, recording will be switched to the program with the later recording start time.

Example



When recording of program number 3 is terminated, program number 2 will be recorded for its remaining time.

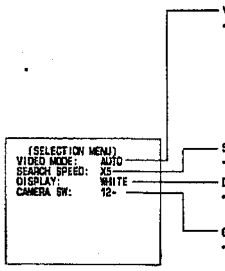
6. When two programs have the same start time, the program number with the earlier stop time has priority.

■ To correct information
1. Press the START/STOP button.
2. Press the UP or DOWN button repeatedly until the item to be corrected (Program number or program event location of day of the week) flashes on/off.
3. When the section to be corrected flashes on/off, press the SET button.
   - Press the SET button again so that only the digit to be corrected flashes on/off.
4. Press the UP or DOWN button to correct the set information.
5. After completing the correction, press the START/STOP button.

SETUP (Continued)

SETTING THE VCR FUNCTIONS

The SELECTION MENU screen allows you to select the VCR operations and functions to match the applications.



VIDEO MODE (AUTO, COLOUR, B/W)
- Use during recording or playback if the video signal is unstable, etc.

AUTO:	The unit automatically detects the type of the video input or playback signal and switches to the colour or black-and-white video signal mode, as appropriate.
COLOUR:	Selects the colour video signal mode.
B/W:	Selects the black-and-white video signal mode.

SEARCH SPEED (3, 5, 7 or 9 times the normal speed)
- You can select the visual search speed.

DISPLAY (WHITE or BLACK)
- You can select whether black or white characters are displayed on the screen.

CAMERA SW (12~, ALL, 03 ONLY)
- You can select the timing with which pulses are output to switch the camera.

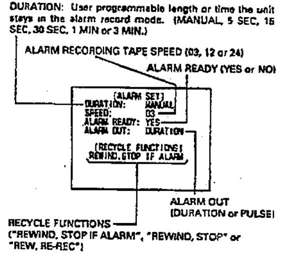
12~:	The pulses are output during recording at 12 or a longer speed mode.
ALL:	The pulses are output during recording in all modes.
03 ONLY:	The pulses are output during recording at the 03 speed mode.

SELECTION MENU Format Description

1. Press the START/STOP button.
   The VIDEO MODE option "AUTO" flashes on/off.
2. Press the SET button repeatedly until the item the setting of which you want to change flashes.
3. Press the UP or DOWN button to select the value or setting you want.
4. After selecting, press the START/STOP button.

SETTING THE ALARM

The ALARM function allows the user to set the recording duration, speed to be recorded and tape recycle for alarm recordings. When a contact closure occurs at the ALARM IN input, the VCR automatically enters the RECORD mode at the pre-programmed ALARM recording speed. (See Alarm In, page 8 for a complete description of the ALARM sequence.) The ALARM recording duration can last from 5 seconds to 3 minutes, or until the contact closure is reopened.
The ALARM recording speed can be pre-programmed to 03 (real time) 12, or 24.
The checking signal is automatically recorded on the tape at the beginning of each ALARM recording. Later, you can easily locate the start of each recording by using these signals when watching a recorded content. See "ALARM INDEX SEARCH" on page 18 for details.
The TIME/DATE display is set as follows during ALARM display.
—ALARM stars (*) will replace the colons (:).
—The recording speed will be changed to 03, 12 or 24 which was selected at the "SPEED" setting in the ALARM display.


DURATION: User programmable length or time the unit stays in the alarm record mode. (MANUAL, 5 SEC, 15 SEC, 30 SEC, 1 MIN or 3 MIN.)
ALARM RECORDING TAPE SPEED (03, 12 or 24)
ALARM READY (YES or NO)
(ALARM SET)
DURATION: MANUAL
SPEED: 03
ALARM READY: YES
ALARM OUT: DURATION
(RECYCLE FUNCTIONS)
REWIND, STOP IF ALARM
ALARM OUT (DURATION or PULSE)
RECYCLE FUNCTIONS ("REWIND, STOP IF ALARM", "REWIND, STOP" or "REW, RE-REC")

ALARM Display Format Description

Notes:
- When the ALARM recording ends, the unit will return to the original record speed and restore the original record speed values to the TIME/DATE displays.
- Select 03 at the "SPEED" setting when the duration is within 30 seconds. If the 12 or 24 speed is selected, electronic "marks" are not recorded on the tape and alarm index search will not operate.

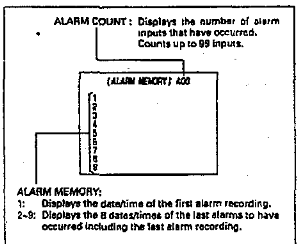
1. Press the START/STOP button. The duration setting flashes on/off.
2. Press the UP or DOWN button until the desired setting appears on the monitor: (MANUAL, 5, 15, 30 SEC, 1, 3 MIN)
3. Press the SET button. The record speed setting flashes on/off.
4. Press the UP or DOWN button until the desired setting appears on the monitor. (03, 12, 24 HR.)
5. Press the SET button. The alarm ready setting flashes on/off.
6. Press the UP or DOWN button to select the alarm ready function. (YES or NO)
   Select "YES" if you want to start alarm recording even in the normal record or stop mode.
   Select "NO" if you do not want alarm recording in the stop mode.
7. Press the SET button. The alarm out setting flashes on/off.
8. Press the UP or DOWN button to select the alarm out function. See "ALARM OUT" on page 8 for details. (DURATION or PULSE)
9. Press the SET button.
   The RECYCLE position flashes on/off.
10. Press the UP or DOWN button to select the mode at the end of tape. See "TAPE RECYCLE" on page 16 for details.
11. Press the START/STOP button.
    Programming for the ALARM has been completed.

Note: To record the time and date, press the PROGRAM button so they are displayed.

SETUP (Continued)

ALARM MEMORY RECALL AND RESET

The VCR signals that an alarm has occurred by flashing the ALARM Indicator. If a power loss has occurred, a "PL" will appear in the first line of the TIME/DATE I display.


ALARM COUNT: Displays the number of alarm inputs that have occurred. Counts up to 99 inputs.
(ALARM MEMORY) A00
1
2
3
4
5
6
7
8
9
ALARM MEMORY:
1: Displays the date/time of the first alarm recording.
2~9: Displays the 8 dates/times of the last alarms to have occurred including the last alarm recording.

ALARM MEMORY Display Format Description

To recall the ALARM display:
1. Press the PROGRAM button until the ALARM MEMORY display appears on the monitor.
2. Log the time/date information from the ALARM memory.

After checking the alarm times and dates, press the ALARM RESET button to clear the ALARM memory.
Notes:
- When the ALARM RESET button is pressed once, if "PL" is flashing, "PL" will disappear. Press the button again to clear the ALARM memory.
- When "PL" is not flashing, press the ALARM RESET button once to clear the ALARM memory.

OPERATION

TAPE RECORDING

CAUTION: Recording over existing recorded ma*terial will completely erase that material. To prevent* accidental recording over the end of a previous recording, advance the tape several seconds before beginning the next recording.
1. Insert a video cassette; be sure the cassette safety tab is intact, or the tab slot is covered.
2. Press the REC/PLAY HOURS button until the desired tape speed is observed on the tape speed indicator.
3. Press the RECORD button to start recording.
4. Press the STOP button to stop recording.

Notes:
—The tape speed mode can be changed during recording.
—AUDIO can be recorded at 03, 12 and 24 tape speed modes.

This VCR offers two special recording functions, TIMER recording and ALARM recording.

REC CHECK

This function allows you to check whether the pictures are being recorded normally or not during recording.
When the PLAY button is pressed during recording, the recorded picture is played back for several seconds. Then recording will continue.

TIMER RECORDING

This VCR can also record at any speed on TIMER command (turn on/off to record during any 24-hour time period). To program the TIMER function, refer to pages 11 and 12.
To operate the TIMER recording function, follow the tape recording procedure, step 1, then press the TIMER button to activate the programmed TIMER function.

TAPE RECYCLE

The "RECYCLE FUNCTIONS" in the ALARM display determine the mode after recording at the end of tape.
When the "REWIND, STOP IF ALARM" is selected:
—If no alarm has been received during the recorded period, the VCR automatically rewinds to the beginning of tape and continues recording.
—If an alarm has been received via the ALARM IN terminal during the recording period, the VCR automatically rewinds to the beginning of tape and then enters the STOP mode.

When "REWIND, STOP" is selected:
—When the tape reaches the end during recording, the VCR automatically rewinds to the beginning of tape and enters the STOP mode.
When "REW, RE-REC" is selected:
—When the tape reaches the end during recording, the VCR automatically rewinds to the beginning of tape and continues recording.

Note: When "REWIND, STOP" or "REW, RE-REC" is selected, the VCR operates whether an alarm has occurred or not.

Recycle	Alarms Present on Recorded Tape	Results
REWIND, STOP IF ALARM	YES	Rewinds tape, then stops. Will not respond to alarm input.
	NO	Rewinds tape then continues to record.
REWIND, STOP	YES	Rewinds tape, then stops. Will not respond to alarm input.
	NO	Rewinds tape, then stops. Will not respond to alarm input.
REW, RE-REC	YES	Rewinds tape then continues to record.
	NO	Rewinds tape then continues to record.

OPERATION (Continued)

ALARM RECORDING

This VCR can automatically record at one of three speeds (03, 12 or 24) on ALARM command.
To program the ALARM function refer to page 14.
The remote/contact switch must be connected to the VCR. See page 8.
To operate the ALARM recording in the stop mode: follow the tape recording procedure, step 1, then select "YES" of the ALARM READY menu in the ALARM display.

MASTER SYSTEM RESET

Press the two reset buttons simultaneously to provide a MASTER SYSTEM RESET. Use to reset abnormal displays and operations. The programmable features must be re-programmed.

PLAYBACK

1. Rewind the tape to the desired beginning point. (Press the REWIND button, and observe the digital counter until the desired number appears.) Press the stop button.
2. Press the REC/PLAY HOURS button until the desired tape speed is observed on the tape speed indicator.
3. Press the PLAY button to initiate forward playback.
   To select reverse playback, press the PLAY button and then press the REVERSE PLAY button. Forward playback resumes when the PLAY button is pressed.
   Notes:
   - When the REVERSE PLAY button is pressed in the forward playback mode to set the VCR to the reverse playback mode, the first several frame images may be distorted.
   - The VCR will automatically enter the STOP mode if the reverse play is continued for approx. 1 minute.
4. Press the STOP button to stop playback.

Notes:
—The tape speed mode can be changed during playback.
—When a picture recorded in the 03 mode is played back in the A12 or A24 mode, it includes noise. It is recommended that you play back pictures recorded in the 03 mode at modes higher than 24.
—When the tape reaches the end, the unit automatically rewinds to the beginning of the tape and then goes to the STOP mode.
—If the monitor display exhibits distortion in the upper part of the picture, adjust the horizontal hold control on the monitor.
—Adjust the SLOW TRACKING control to minimize noise when playing back at slow speed (24 Hr.) or in the FIELD ADVANCE/REVERSE mode.
—The playback picture is not stable and has some noise at A12 or A24 mode. And in these modes TRACKING control is not effective.

STILL PLAYBACK

When the STILL button is pressed during playback, a still picture can be seen. To start again press STILL or PLAY button and the VCR will continue playback.
Notes:
- When still playback continues for more than 5 minutes, the AUTO-PROTECT circuit operates and the VCR will enter the STOP mode automatically.
- If the picture shakes up and down during still playback, adjust the V.LOCK control.

V.LOCK ADJUST

If the picture shakes up and down during still playback, adjust the picture by the following procedure.
1. Play back a tape, recorded in the 03 mode, in the still playback mode.
   - With some TVs, if the V.LOCK control is adjusted when playing a tape recorded in modes other than 03, shaking of the still picture may not stop.
2. Adjust the V.LOCK control so the shaking of the picture stops.

Note: Shaking of the picture may not be stopped completely depending on the TV used.

PLAYBACK IN THE FIELD ADVANCE/REVERSE MODES

When you press the FIELD ADVANCE or FIELD REVERSE button during still playback mode, one field at a time can be seen.
Operates only after STILL button has been pressed.
Notes:
- An AUTO-PROTECT circuit automatically returns the unit to the STOP mode if the STILL or PLAY button is not pressed again or if FIELD ADVANCE or FIELD REVERSE button is not pressed in any five minute period.
- When the FIELD REVERSE button is pressed in the still playback mode to set the VCR to the field reverse mode, the first several frame images may be distorted.

VISUAL SEARCH (High Speed Scan)

Note: The visual search function allows the recorded material to be reviewed at 3, 5, 7 or 9 times the 03 hour speed mode.
1. Press the PLAY button.
2. Press the SEARCH (F.FWD) button to select the VISUAL SEARCH FORWARD mode, or press the SEARCH (REWIND) button to select the VISUAL SEARCH REVERSE mode.
3. Press the PLAY button again to resume normal playback.

Notes:
- The visual search speed can be changed using the SELECTION MENU screen.
- The playback picture will have some noise in the visual search mode.

ALARM INDEX SEARCH

The alarm index search method causes electronic "marks" to be recorded on the tape at each point when the ALARM recording begins.
Later, the VCR can find these "marks" automatically, making it easy to find the beginning of each alarm for playback.
These check points are permanent until the tape is erased. A check mark is recorded automatically each time the VCR starts ALARM recording.
1. Press the PLAY button to start playback.
2. Press the ALARM INDEX button.
3. Press the REW or F.FWD button. The recorder enters VISUAL SEARCH mode.
4. When the VCR finds a mark, it enters normal playback mode.
5. Press REW or F.FWD button again to find next "marked" recording. The recorder advances tape to the next marked position.
6. Press the ALARM INDEX button again to release alarm index search.

Notes:
1. Be careful as no alarm input can be detected for 5 seconds immediately after the visual search mode is entered by pressing the REW or F.FWD button during the alarm index search mode.
2. When tapes recorded by other VCRs are played in the alarm index search mode, the VCR may enter the play mode in a meaningless position.
3. When you have selected "MANUAL" at the DURATION setting in the ALARM display, and the duration of an alarm recording is shorter than the values shown below, "marks" may not be detected.
   SPEED
   03 ....5 seconds
   12, 24 ....60 seconds

TO SECURE THE VCR

This feature restricts unauthorized use, tampering, or accidental changes in the operation of the VCR. The security feature does not operate during programming. Simultaneously press the SET and DOWN buttons in the program set area of the front panel. The security message "L" appears in the *TIME/DATE I display and the LOCK indicator lights* in the VCR's display.
To release the security feature, press the SET and DOWN buttons simultaneously.

PROBLEM GUIDE

If you are having this kind of trouble:	Check these things:
▪ No power (No indicators ON)	□ Check to see if unit is plugged in. (Power at supply outlet?)
▪ Recorder fails to respond to user command/ operation	□ Perform MASTER SYSTEM RESET. See page 17.
▪ *No monitor picture*	□ *Carefully check monitor/VCR/camera connectors.*
▪ Poor picture during monitor viewing (in the RECORD or STOP mode)	□ Check monitor/camera adjustments.
▪ Black streaks on picture during 03, A12 or A24 mode playback	□ Adjust the TRACKING control (may need to be returned to center position if previously adjusted). The TRACKING control is only active for the 03, A12 or A24 mode. □ Replace cassette. □ Clean video heads.
▪ Recording or playback cannot be done	□ Remove cassette and reinsert. □ Check the LOCK indicator on the front panel. If the indicator is lit, press both SET and DOWN buttons simultaneously to release the security lock.
▪ RECORD functions not operate	□ Check the TAB indicator is lit. □ See Note on page 9.
▪ PLAY function not operate	□ Be sure there is a cassette in the unit.
▪ TIME/DATE information not displayed on the MONITOR	□ Press the PROGRAM button. □ Perform MASTER SYSTEM RESET. See page 17.
▪ TIMER recording was not done	□ TIMER may not have been set properly. □ Check for SAFETY TAB of cassette. □ TIME and DATE are not correct. □ Cassette tape length may have been exceeded. Multiple ALARMs used up tape.
▪ REWIND or FAST FORWARD does not operate	□ Tape may already be rewound or be at the end of tape.
▪ Unable to SELECT/CHANGE program feature	□ Check the LOCK indicator on the front panel. If the indicator is lit, press both SET and DOWN buttons simultaneously to release the security lock.
▪ The VCR does not operate if an operation button is pressed	□ Press the EJECT button to remove the cassette, then restart VCR operations.

4.SERVICE MANUAL ABBREVIATION LIST

A	
ACC	Automatic Color Control
ACK	Automatic Color Killer
ADC B-Y	Analog to Digital Converted B-Y Signal
ADC R-Y	Analog to Digital Converted R-Y Signal
ADC Y	Analog to Digital converted Luminance
ADD	Adder
ADRS	Address
A.DUB	Audio Dubbing
AF	Autofocus
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
AGC KILLER	AGC Killer Voltage
ALC	Automatic Level Conrol
AM	Automatic Iris Control
AMP	Amplifier
APC	Automatic Phase Control
ASBL	Assemle (Phase Matching)
AUD.	Audio
AUX	Auxiliary

B	
B (BLU)	Color Signal BLUE
BATT.	Battery
BF	Burst Flag
BG	Burst Gate or Back Ground
BGP	Burst Gate Pulse
BH	Power Supply for Selecting VHF Figh Band
BL	Power Supply for Selecting VHF Low Band
BLK	Blanking
BM	Power Supply for Selecting VHF Mid Band
BPF	Bandpass Filter
BS	Power Suplly for Selecting VHF Super Band
BU	Power Supply for Selecting UHF Band
BU	Back-up
BUF.	Buffer Amplifier
B-YL	Battery

C	
C(CHROMA)	Chrominance Signal
CAPST.	Capstan
CAS	Column Addresss Strobe
CARRI.	Carrier
CATV	Cable TV
C.BLANK	Chroma Blanking
C.BLK	Composite Blanking
CCD	Charge Coupled Device
CG	Character Generator
CFG	Capstan Frequency Generater
C.FREE RUN	Capstan Free Run
CH	Channel
CHD	Camera Horizontal Drive Pulse
CHARA.	Character
CHROMA	Chrominance
C.MEMORY	Counter Memory
CNR	Chroma Noise Reducer
COM.	Common
COMPA.	Comparator
COMPE.	Compensator
COMP-EXP	Compressor-Expander
CONV.	Converter
CONT.	Control
CORR.	Correlation
COUNT.	Counter
CP	Clamp Pulse
C.PAUSE	Camera Pause
C/R	Capacitor/Resistor
C.RESET	Counter Reset
C.REVERSE	Count Reverse

C	
C.REVERSE	Count Reverse
CST	Cassette
C.SYNC	Composite Synchronizing Signal
CTL	Control Track Pulse (Control)
CYL	Cylinder

D	
D	Digital
DA	Double Azimuth
D/A	Digital to Analog Converter
D-D	Direct Drive
DEEMPHA.	Deephasis
DEF	Deflefction
DEMOD.	Demodulator
DEMPX	Demultiplexer
DET	Detector
DIFF. AMP	Differential Amplifier
DISCRI.	Discriminator
DISP.	Display
DL	Delay Line
DN	Down
DO	Dropout
DOC	Dropout Compensator
DRAM	Dynamic Random Access Memory
D.REF 25/30	Delayed Reference 25/30Hz
D.SW 25/30	Delayed Switching 25/30Hz
DSP	Digital Signal Processor
DT/OE	Data Transfer/Output Enable
D/W	Dark White
DWC	Delayed Write Clock

E	
EAROM	Electrically Alterable Read Only Memory
EEPROM	Electrical Erasable Proframmed
E-E	Electronic-to-Electronic
EMPHA.	Emphasis
EQ	Equalizer
EVF	Electronic Viewfinder
EXT.	External

F	
F.ADV	Frame Advance
F/V	Frequency-to-Voltage Converter
FB	Feed back
FF	Flip Flop
F.FWD	Fast Forward
FG	Frequency Generator
FLE	Frequency Modulation
FM	Frequency
FREQ.	Frame Advance
fsc	Color Sub Carrier Frequency
FWD	Forward

G	
GEN.	Generator
GND	Ground

H	
H (HORIZ.)	Horizontal
HBF	Horizontal Burst Flag
HD	Horizontal Drive
Hi-Fi	High Fidelity
HLT	Halt
HPF	High-pass Filter
HPL	High-pass Limiter
HSS	Horizontal Sync. Separator

I	
IF	Intermediate Frequency
INC	Row Couter Increment
INDI.	Indicator
INT.	Internal

I	
INV.	Inverter
I/O	In/Out (Input/Output)
IR	Infrared Rays
IRIS DET	Iris Detection
IRT	Instant Recording Timer
L	
LCD	Liquid Crystal Dissplay
LIN.	Linear
LM	Loading Motor
LNC	Line Noise Canceller
LOG	Logarithm
LP	Long Play
LPF	Low-pass Filter
LUMA	Luminance
L/R	Left/Right
M	
MAN	Manual
M.BRAKE	Main Brake
M.CUT	Monitor Cut
MEM.	Memory
MIX	Mixer
MMV	Monostable Multivibator
MOD.	Modulator
MPX	Multiplex
MPX VIDEO	Multiplexed Video
M.STATE	Mechanism State
M.STOP	Memory Stop
MTS	Multi Channel Television Sound
N	
NEG	Negative
NFB	Negative Feed Back
NORM.or NOR.	Normal
NR	Noise Reduction
O	
OB	Optial Black
O/E	Odd/Even Field
OSC	Oscillator
OSD	On-Screen Display
P	
PB/PLAY	Playback
P.CONT	Power Control
PIF	Picture Intermediate Frequency
PG	Pulse Generator
PIX MOVE	Picture Move
PLL	Phase Locked Loop
POS.	Positive
POWER CONT.	Power Control
PROG.	Program
PROTECT.	Protector
PWM	Pulse width modulation
R	
R (RED)	Color Signal RED
RAM	Random Access Memory
RAS	Row Address Strobe
RC	Reading Clock
RCC	Reading Clock Clear
RCR	Row Counter Reset
REC	Record
RECT.	Rectifier
REF	Reference
REF 25/30	Reference 25/30Hz from servo circuit
REG	Regulator
REL	Refresh Control
REW	Rewind
REV	Review
RF	Radio Frequency

R	
RM	Reel Motor
ROM	Read Only Memory
R-YL	Color Dfference Signal R-YL
S	
SAP	Second Audio Program
SAW	Sawtooth
SC	Serial Control
SC1 (0-)	3.58MHz Subcarrier Signal 1 (0-degree Phase Shifted)
SC2 (90-)	3058MHz Subcarrier Signal 2 (90-degree Phase Shifted)
SEPA.	Separator
SG	Signal Generator
S/H	Samle and Hold
SIF	Sound Intermediate Frequency
SOL	Solenoid
SP	Standard Play
SP/LP	Standard Play/Long Play
S.REEL	Supply Reel Sensor
SRCH	Search
SRV	Servo
STABI.	Stabilizer
S.TRACK	Slow Tracking
STBY	Standby Mode
S-VHS	Super VHS
SW 25/30Hz	25/30Hz Head Switching Pulse
SYNC	Synchronizing signal
SYS.CON	System Control
T	
T (TELE)	Telephoto Angle
T.BRAKE	Take-up Brake
T/L	Tuner/Line
TP	Test Point
T.REEL	Take-up Reel Sensor
T.RESET	Timer Reset
TRS	Transfer
U	
U/D	Up/Down
UNI.	Unified
V	
V (VERT.)	Vertical
V.AGC	AGC Voltage
VCA	Voltage Controlled Amplitier
VCO	Voltage Controlled Oscillator
V.DUB	Video Dubbing
V/F	Voltage to Frequency Converter
VHS	Video Home System
VF	Focus Voltage
VOL.	Volume
VP	Voltage Reference
VSS	Vertical Sync. Separator
Vss	Voltage Super Source
VT	Tuning Voltage
VT-U	Tuning Voltage-UHF
VT-V	Tuning Voltage-VHF
VCXO	Voltage Controlled Crystal Oscillator
W	
WC	White Clock
WCC	White Clock Clear
WE	Weighting
WHT	Color Sifnal WHITE
WIDE	Wide Angle
WHD	Wide Horizontal Drive
WHT BAL CONT.	White Balance Control
Y	
Y/C	Luminance/Chrominance

5.LEADLESS (CHIP) COMPONENT IDENTIFICATION

1.Leadless Transistor

The part name of a leadless transistor is indicated by a code on its surface, using one letter, one letter and one numeral,two letters, two letters and one numeral, two numerals, two numerals and one letter, three letters, or four letters.

Note: There are transistors with the same code but different part names, or with the same part name but different codes. Refer to the parts lists to finally identify a transistor.

CODE	PART NAME	CODE	PART NAME
Leadless (Chip) Transistor			
3925	2SC3925	BQ	2SB709A
ICQ	2SCB902	BR	2SC4081R
ID	2SC3127	BR	2SC2412K
IDS	2SD1328S	BR	2SC4617
IDT	2SD1328	BS	2SC2412K
1R	2SB970TX	C-7	2SA811
2BQ	2SK374PQ	C1G	KSC1623
2BR	2SK374QR	CB	2SC3646
2Y	2SC3757	CC	2SA1122C
2YQ	2SC4691	CC	2SC3647T
3N	2SK620	CC	2SC3647
4N	XN5601	CD	2SA1122D
4Q	XN1B301	CE	2SA1122E
4R	XN1C301	CK	2SD999
5C	XN4601	CP	2SC4097
5C	XP4601	CQ	2SC2411K
5H	XP4501	CR	2SB710
5H	XN4501	CR	2SC2411
5K	XP4401	CR	2SB1219
5K	XN4401	D16	2SC1622A
5L	XN5501	D17	2SC1622A
5N	XN6501	D18	2SC1622A
5O	XN6401	DB	2SD1766
5R	XP1501	DE	2SC2463
5R	XN1501	DF	2SD1623
5S	XN1504	DF	2SD1898
5V	XN1401	DG	2SD1624
5W	XN2501	DK	2SB798
5X	XN4504	EC	2SA1022
7R	XN2401	F-2	2SC1009F2
7S	XN1601	F-3	2SC1009F3
AA	2SD1757K	F-4	2SC1009F4
AKQ	2SA1738	FC	2SC2619
AKQ	2SA1806	FR	2SA1774
AL	2SA1791	FR	2SA1037K
AM	2SC4656	FR	2SA1576R
AO	2SB709AQR	FS	2SA1037K
AQ	2SB709AQ	GC	2SC2734
AQ	2SB766	GM	3SD1615
AR	2SB1462	HQ	2SA1036K
AR	2SB766	IC	2SC3016
AR	2SB709ARS	IRD	2SA1484
AR	2SB1218R	IS	2SB792S
AS	2SB766	IT	2SB792T
AS	2SB709AS	L-4	2SC1623L4
B3	2SC1621B3	L-5	2SC1623L5
B4	2SC1621B4	L-6	2SC1623L6
BC	2SB1188	L-6	2SC2812L6
BD	2SB1121	L-7	2SC2812L7
BE	2SB1260	L5	MMBC1623L5
BF	2SB1123	L6	MMBC1623L6
BF	2SB1308	LB	2SC2462B
BG	2SB1124	LC	2SC2462C
BH	2SB1001	LD	2SC2462D

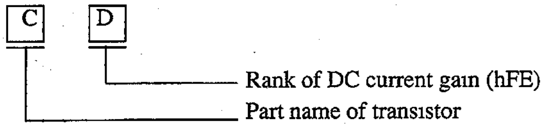
CODE	PART NAME	CODE	PART NAME
Leadless (Chip) Transistor			
LR	2SC2412KLN	T2	IMT2
M-5	2SA812	UD	2SC2404
M-6	2SA1179	ZS	2SD874S
MC	2SA1052MC	VR	2DS968A
MD	2SA1052MC-D	W1	FMW1
N3	2SC1653	W10	FMW10
ND	2SD1306ND	W2	FMW2
NE	2SD1306NE	W3	FMW3
PD	2SA1171D	WR	2SD602
PS	2SD814	X1	UMX1
QB	2SC2520QB	X1	IMX1
QC	2SC2620QC	X2	IMX2
QO	2SC2714	Y1	FMY1
R22	2SC4226	Y12	2SA1464
R22	2SC3356	Y25	NTM3906
R32	2SC4227	Y3	FMY3
R34	2SC3583	YCD	2SK197
R42	2SC3585	YI	2SA1666
RB	2SC2618RB	YQ	2SD601YQ
RC	2SC2618RC	YR	2SD601YR
RK	2SC3357	YR	2SD1819R
S1	FMS1	YR	2SD2216
S2	FMS2	YS	2SD601YS
SC	2SA1121	Z1	IMZ1
SO	2SA1162	Z2	IMZ2
SP	2SC3082K	ZO	2SD874T
T1	IMT1	ZQ	2SD601A
T1	UMT1	ZR	2SD874R
Digital Transistor			
3	DTC143TK	6C	UN9113
4	DTC114TK	6S	NP4113
6	DTC144TK	8B	UN5212
13	DTA143EK	8C	UN9213
14	DTA144EK	8C	UN2213
15	DTA124K	8S	XP4213
15	DTA124EU	9L	XP1213
16	DTA144EU	9L	XN1213
16	XDA144EK	A1	FMA1
16	DTA144EE	A1	UMA1
23	DTC143EK	A2	FMA2
24	DTC114EU	B2	UMB2
24	DTC144EK	B2	IMB2
25	DTC124EU	C2	FMC2
25	DTC124K	C5	FMC5
26	DTC144EE	D2	IMD2
26	DTC144EU	F52	DTB123
26	XDC144EK	G1	FMG1
33	DTA143XK	G2	FMG2
43	DTC143XK	G21	DTD113ZK
52	DTA123YK	G5	FMG5
60	UN511F	H03	DTC343TK
64	DTC114YK	H2	IMH2
80	UN521F	H2	UNH2
4P	XN1A312T	H27	DTC363EK
6B	UN5112	RO4	KSR1104
6C	UN2113	R31	FP1L2Q
FET			
30	2SK621	KB	2SK323
1FQ	2SK321FQ	WS	2SK322T
1FR	2SK321FQR	WT	2SK322T
1KP	2SK316	X15	2SK425
2BQ	2SK663	X4	2SK94
DY	2SK1579	XAF	2SK980FG
JO	2SK208	YC	2SK197YC
K	3SK166	YD	2SK197YD
K4	2SK160K4	YE	2SK197YE
K5	2SK160K5	ZD	2SK217ZD

(1)Identification with two letters

Use this code and the following chart for transistor identification.

Example :

Code	Part name
CD	2SA1122D
LD	2SC2462D

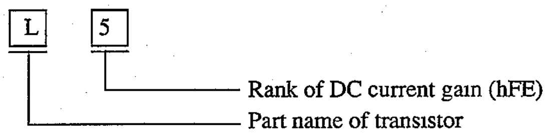

C
D
Rank of DC current gain (hFE)
Part name of transistor

(2)Identification with one letter and one numeral

Use this code and the following chart for transistor identification.

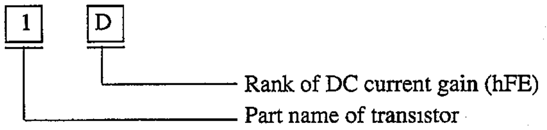
Example :

Code	Part name
L5	2SC1623(5)
L6	2SC1623(6)


L
5
Rank of DC current gain (hFE)
Part name of transistor

Example :

Code	Part name
1D	2SC3127D


1
D
Rank of DC current gain (hFE)
Part name of transistor

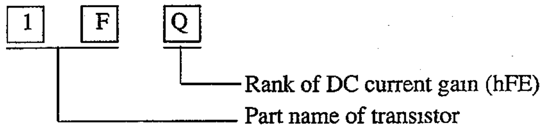
Note: Codes S1,S2,T1,W1,W2,W3,X1,Y1,Y3,Z1 and Z2 encode only the part names.

(3)Identification with one numeral and two letters

Use this code and the following chart for transistor identification.

Example :

Code	Part name
1FQ	2SK321Q

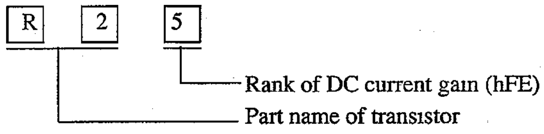

1
F
Q
Rank of DC current gain (hFE)
Part name of transistor

(4)Identification with one letter and two numerals

Use this code and the following chart for transistor identification.

Example :

Code	Part name
R25	2SC3356

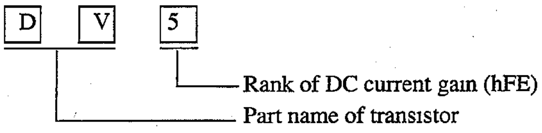

R
2
5
Rank of DC current gain (hFE)
Part name of transistor

(5)Identification with two letters and one numeral

Use this code and the following chart for transistor identification.

Example :

Code	Part name
DV5	2SD596

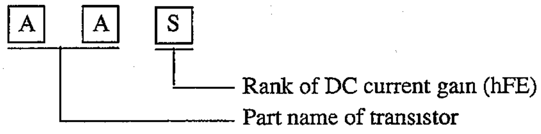

D
V
5
Rank of DC current gain (hFE)
Part name of transistor

(6)Identification with three letters

Use this code and the following chart for transistor identification.

Example :

Code	Part name
AAS	2SD1757KS


A
A
S
Rank of DC current gain (hFE)
Part name of transistor

2.Leadless Diode

The part name of a leadless diode is indicated by a code on the surface, using one letter and one numeral,two letters, two letters and one numeral, two numerals and one letter, or three numerals. Use this code and the following table to identify the part name of a diode.

Note: Refer to the parts lists to finally identify a diode.

CODE	PART NAME	CODE	PART NAME
Diode			
0	HVU300A	3D	RB715F
1.0	ISV201	3.0L	MA3030L
2.0	MA3020	3.6L	MA3036L
5.1	MA3051L	3.9L	MA3039L
5.1	MA3051M	4.3H	MA3043H
6.8	MA3068	4.3L	MA3043L
6.8	MA3068M	4.3M	MA3043M
7.5	MA3075L	4.7L	MA3047L
8.2	MA3082M	4.7M	MA3047M
9.1	MA3091	5.1H	MA3051H
20	HZM6	5.1L	MA3051L
24	ISV221	5.1M	MA3051M
27	RD2.7M B	5.6M	MA3056M
30	RD3.0M B	6.2L	MA3062L
51	RD5.1M B2	6.2M	MA3062M
56	RD5.6M B	6.8H	MA3068H
91	RD9.1M B	6.8L	MA3068L
102	RD10M B2	6.8M	MA3068M
122	RD12M B2	6.8M	MA3068
163	RD16M B3	7.5H	MA3075H
182	RD10M B2	7.5L	MA3075L
271	RD2.7M B	8A	UN221D
272	D2.7M B2	8.2H	MA3082H
301	RD3.0M B	8.2M	MA3082M
362	D3.6M B2	9.1M	MA3091M
391	D3.9M B1	9.1M	MA3091
512	RD5.1M B2	10L	MA3100L
561	RD5.6M B	10M	MA3100M
621	RD6.2M B1	11L	MA3110L
681	RD6.8M	12M	MA3120M
683	RD6.8M B3	13H	MA3130H
911	RD9.1M B	18M	MA3180M
2.7H	MA3027H	36M	MA3360

CODE	PART NAME	CODE	PART NAME
Zener Diode			
1A	MA110	M3A	MA199
A3	1S2835	MC	MA153
A4	HSM2836C	MC	MA143
A5	1S2837	MH	MA141K
A6	HSM2838C	MH	MA151K
B	SB0505CP	MH	MA152K
B64	SFPB64	MI	MA132K
B74	SFPB74	MN	MA141WA
BE	1SV172	MN	MA152WK
C1	HSM88S	MN	MA132WA
C2	HSM276S	MO	MA152WA
C3	1SS226	MO	MA133
C4	HSM88WK	MP	MA151WK
F7	KV1470	MT	MA141WK
H5	HVM14	MT	MA141WK
J	SB07-03C	MU	MA132WK
K	DA221	MU	MA151WA
M1A	MA159	N	DAN222
M1C	MA158	N	DAN202T
M1M	MA721	NU	MA152WK
M1N	MA713DAT	P	DAP202T
M1P	MA714	S4	DIFS4
M2A	MA122	SA	SB10-05P
M2B	MA123	Z	DA106K

3.Leadless Resistor

The resistor value is indicated on its surface, using three numerals, or one letter and one numeral.

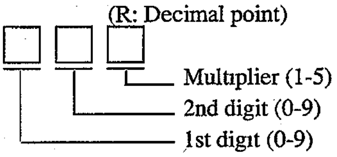
(1)Identification with three numerals

Read this code following the same procedure as when reading the color code on discrete resistors.

Example:

code	value
330	$33 \times 10^0 = 33$ ohms
561	$56 \times 10^1 = 560$ ohms
123	$12 \times 10^3 =$ 12K ohms
1R2	$1 + 0.2 = 1.2$ ohms

(R: Decimal point)



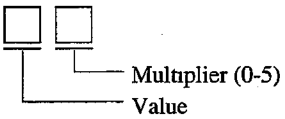
(2)Identification with one letter and one numeral

Use this code and the following chart for resistor identification.

Letter	Value	Letter	Value	Letter	Value
A	1	J	2.2	S	4.7
C	1.2	L	2.7	U	5.6
E	1.5	N	3.3	W	6.8
G	1.8	Q	3.9	Y	8.2

Example

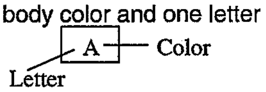
code	value
A1	$1 \times 10^1 = 10$ ohms
G2	$1.8 \times 10^2 = 180$ ohms
L3	$2.7 \times 10^3 = 2700$ ohms
S4	$4.7 \times 10^4 =$ 47K ohms
W5	$6.8 \times 10^6 =$ 680K ohms



4.Leadless Capacitors

The capacitor value is indicated on its surface, using body color and one letter, or one letter and one numeral.

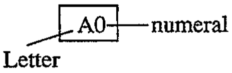
(1)Identification with body color and one letter



Body Color	Letter	Value	Body Color	Letter	Value
Red	A	1(PF)	Blue	G	180(PF)
	C	2		J	220
	E	3		L	270
	G	4		N	330
	J	5		Q	390
	L	6		S	470
	N	7		U	560
	Q	8		W	680
	S	9		Y	820
Black	A	10(PF)	White	A	0.001(オF)
	C	12		E	0.0015
	E	15		J	0.0022
	G	18		L	0.0027
	J	22		N	0.0033
	L	27		S	0.0047
	N	33		W	0.0068
	Q	39	Green	A	0.01(オF)
	S	47		E	0.015
	U	56		J	0.022
	W	68		N	0.033
	Y	82		S	0.047
Blue	A	100(PF)		U	0.056
	C	120		W	0.068
	E	150		Y	0.082
			Yellow	A	0.1(オF)

Example : Color	Letter	Value
Red	A	1PF
Black	A	10PF

(2) Identification with one letter and one numeral



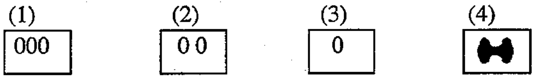
Letter/Numeral	Value	Letter/Numeral	Value
A0	1(PF)	A2	100(PF)
H0	2	C2	120
M0	3	E2	150
d0	4	G2	180
f0	5	J2	220
m0	6	L2	270
n0	7	N2	330
t0	8	Q2	390
y0	9	S2	470
A1	10(PF)	U2	560
C1	12	W2	680
E1	15	Y2	820
G1	18	A3	0.001(オF)
J1	22	E3	0.0015
L1	27	J3	0.0022
N1	33	N3	0.0033
Q1	39	S3	0.0047
S1	47	W3	0.0068
U1	56	A4	0.01(オP)
W1	68	E4	0.015
Y1	82	J4	0.022
		N4	0.033
		S4	0.047
		U4	0.056
		W4	0.068
		A5	0.1

Example :

Letter/Numeral	Value
A0	1PF
A1	10PF

5.Leadless Jumper

The leadless jumper indicated as shown below.



6.MAINTENANCE/INSPECTION PROCEDURE

1. Required Maintenance

The recording density of a VCR is much higher than that of an audio tape recorder. VCR components must be very precise to ensure compatible with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure a good picture, periodic inspection and maintenance, including replacement of worn-out parts and lubrications, is necessary.

2.Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR, and the environment in which the VCR is used. But, in general home use, a good picture will be maintained if the inspection and maintenance is done every 500 hours. Table 1 shows the relation between time used per day and inspection period.

Table 1

	When inspection is necessary		
Average hours used per day	About 6 months «	About 9 months «	About 18 months «
One hour	▨	▨	▨
Two hours	▨	▨	
Three hours	▨		

3.Check before starting Repairs

The faults occurring in the playback picture as shown in Table 2 can be remedied by cleaning and oiling. Check the need for lubrication and the conditions of cleanliness in the unit. Check with the customer to find out how often the unit is used. If from that you determine that the unit is ready for inspection and maintenance, check the parts shown in Table 2.

Table 2

Phenomenon	Inspection Location
Poor S/N, no color	Dirt on video head or worn video head
Tape does not run or tape is slack	Dirt on pressure roller, cylinder or in tape transport system
Vertical jitter	Dirt on video head or in tape transport system
Low volume or sound distorted	Dirt on video head or worn video head

4. Tools Needed for Inspection and Maintenance

(1) Head cleaning kit
(2) VCR oil and grease (Table 3)
(3) Alcohol
(4) Gauze
(5) Cleaning tape 〔Maxell 8M-CL MCA (dry type)〕

Table 3 Locations for Greasing and Oiling

Name	Oil or Greasing Location
Sonic Slidas Oil (#1600)	Oil low-speed rotating sections
Froil (G31-SA)	Lubricate metal or molded section under light load
Molicoat (PG-641)	Lubricate metal or molded sections under light load
Lock paint	Fix adjustment screws and nuts.

5. Maintenance Procedures

5-1 Cleaning

(1) Cleaning video head

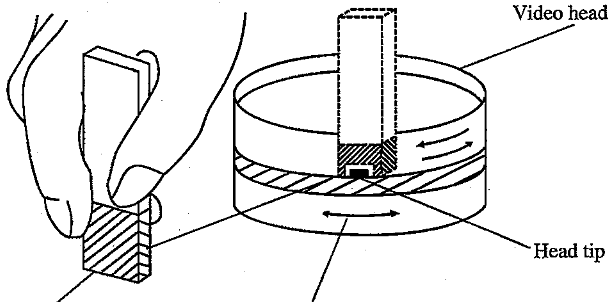
First use a cleaning tape. Be sure to use the specified cleaning tape and read its instruction sheet carefully before using it. If dirt on head is too stubborn to remove by tape, use the cleaning kit. Moisten the cleaning stick with cleaning fluid at the point indicated. Touch the stick to the head tip and gently turn the head (rotating cylinder) to the right and left. (Do not move the stick vertically and make sure that only the chamois leather on the stick comes into contact with the head. Otherwise, the head may be damaged.) Thoroughly dry the head. Then test run a tape. If cleaning fluid remains on the video head, the tape may be damaged when it comes into contact with the head surface.

(2) Cleaning the tape transport system and drive system, etc.

Wipe with gauze moistened with alcohol.

Notes: 1)The tape transport system is the system which comes into contact with the running tape. The drive system consists of those parts which run the tape.

2)Make sure that during cleaning you do not touch the tape transport system with the tip of a screwdriver and that no force is applied to the system that could deform it.



Coat with cleaning fluid

Touch the section of chamois leather to the head tip and gently turn the head

5-2 Lubrication

(1) Guide lines for lubricating with oil

Use the oiler to apply one or two drop or Sonic Slidas oil. Make sure not to use too mach oil because it may spill over or leak out coming into contact with rotating parts and causing slippage or other problems. If too much oil is applied, wipe clean with a alcohol.

(2) Periodic oil lubrication

Lubricate the specified locations only when replacing components. Refer to the exploded views for the lubricating locations.

5-3 Greasing

(1) Greasing guide lines

Apply grease Froil or Molicoat, with a stick or brush. Do not use excess grease. It may come into contact with the tape transport or drive system. Wipe any excess and clean with gauze moistend with alcohol.

(2) Periodic greasing

Grease the specified locations only when replacing components. Refer to the exploded views for the greasing locations.

Table 4 Parts to be Maintained/Inspected and Maintenance/Inspection Schedules

Caution: The following table does not apply to all units. The maintenance/inspection schedules depend on how the unit is used and the environment in which it is used.

Hours Component	500	1000	1500	2000	2500	3000
Video heads (cylinder assembly) C	C／R	C	C／R	C	C／R	
Supply guide roller	C	C	C	C	C	C
Supply guide pole	C	C	C	C	C	C
Take-up guide roller	C	C	C	C	C	C
Pull-out pole	C	C	C	C	C	C
Tension pole	C	C	C	C	C	C
Tension band		R		R		R
Supply reel disk	C	C	C	C／R	C	C
Take-up reel disk	C	C	C	C／R	C	C
Pressure roller	C	C	C	C／R	C	C
Impedance roller	C	C	C	C	C	C
Capstan belt				R		
Reel drive idler				R		
Capstan shaft (capstan motor)	C	C	C	C／R	C	C
Loading motor				R		

C : Cleaning
R : Parts replacing

CHAPTER 2 DISASSEMBLY

1.CASES AND CIRCUIT BOARDS SECTION

1.BEFORE STARTING DISASSEMBLY

[Removal Procedure]

Dismantle each component in numerical order [(A) , (B) , (C) ....]

[Reinstallation Procedure]

Reinstall eachcomponent in the reverse order to removal when otherwise not specified.

Identifications and Locations of Circuit Boards

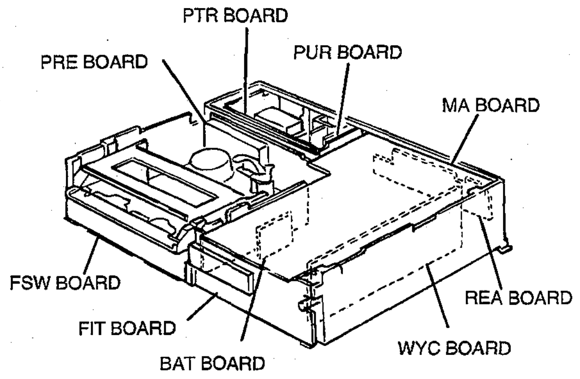


Fig. 2-1 Top View

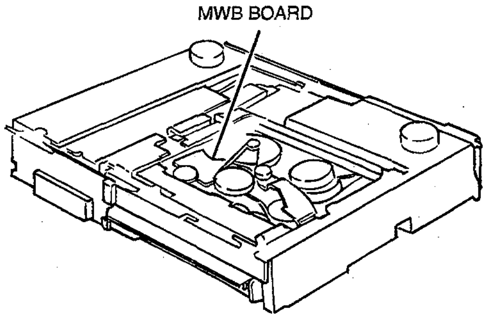


Fig. 2-2 Bottom View

2.DISASSEMBLY PROCEDURE

[How to use the parts hierarchy chart]

1) Locate the part to be replaced.
2) Check the parts in the ranks above the part to be replaced and start dismantling.
3) Replace the difective part and reinstall the parts in the reverse order to that show in the parts hierachry chart.

[Cautions]

1) Dismantle parts in the eject state.
2) Parts can be dismantled in a different way from that shwn here.

Parts Heirarchy Chart

Parts to Removed (First Block)	Item	Parts to Removed (Second Block)	Item	Parts to Removed (Third Block)	Item
Top Cover	2-3	PRE Board	2-10	AF Mechanism	2-11
		PTR Board			
		PUR Board			
Bottom Cover	2-4	MWB Board	2-12		
Front Panel	2-5	Cassette Holder	2-11		
		Front Door Åô	2-5		
		Cassette Door	2-6		
		FSW Board	2-7		
		FIT Board			
		WYC Board	2-9	MA Board	2-9
		BAT Board			
Rear Panel	2-8	REA Board	2-8		
Chassis					

☆ . This can be removed if components in the first block are not removed.

Disassembly Procedure Diagram

1	Top Cover / Bottom Cover

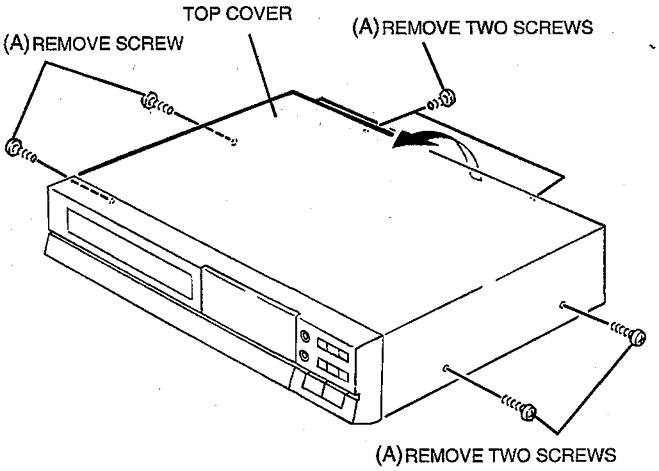

TOP COVER
(A) REMOVE SCREW
(A) REMOVE TWO SCREWS
(A) REMOVE TWO SCREWS

Fig. 2-3

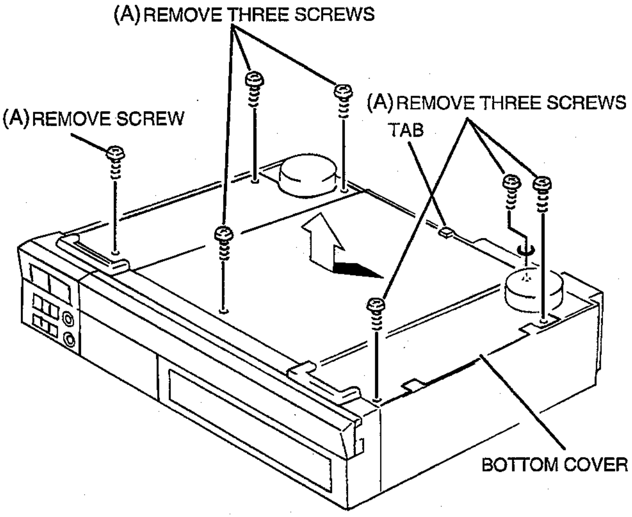

(A) REMOVE THREE SCREWS
(A) REMOVE SCREW
(A) REMOVE THREE SCREWS
TAB
BOTTOM COVER

Fig. 2-4

2	Front Panel / Front Door / Cassette Door

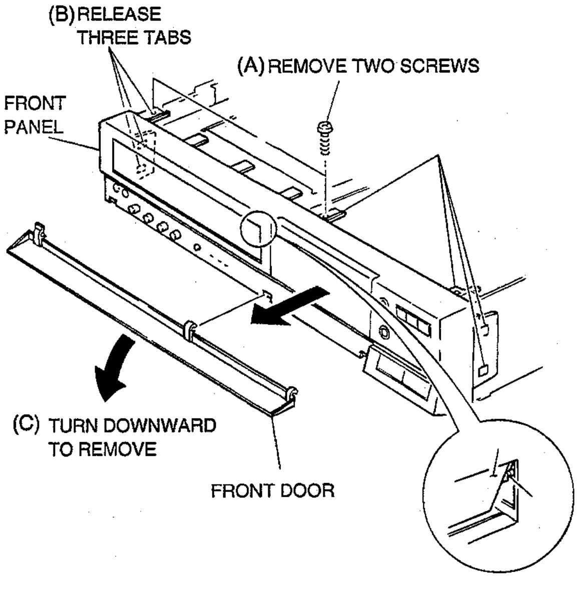

(B) RELEASE THREE TABS
(A) REMOVE TWO SCREWS
FRONT PANEL
(C) TURN DOWNWARD TO REMOVE
FRONT DOOR

Fig. 2-5

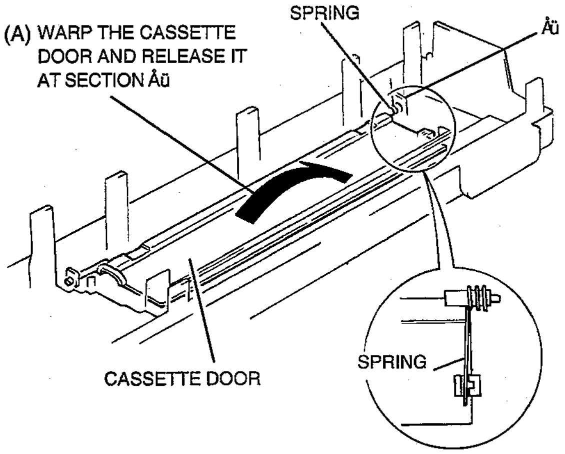

(A) WARP THE CASSETTE DOOR AND RELEASE IT AT SECTION Åü
SPRING
Åü
CASSETTE DOOR
SPRING

Fig. 2-6

3 FSW Board / FIT Board

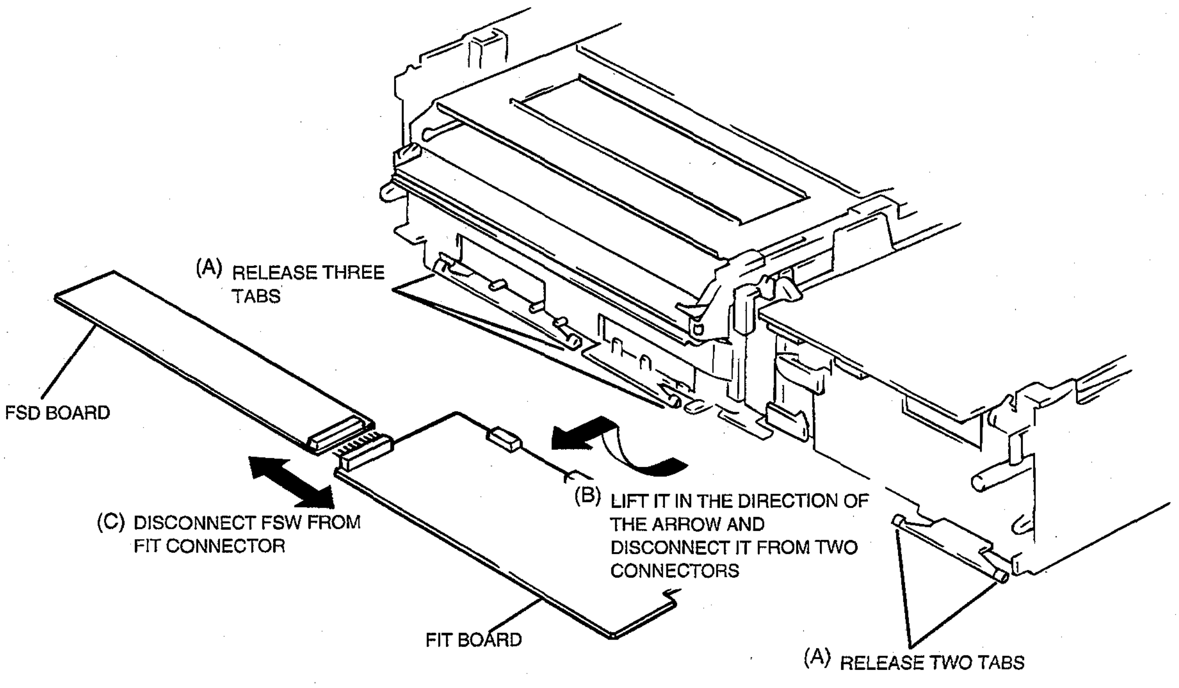

(A) RELEASE THREE TABS
FSD BOARD
(C) DISCONNECT FSW FROM FIT CONNECTOR
(B) LIFT IT IN THE DIRECTION OF THE ARROW AND DISCONNECT IT FROM TWO CONNECTORS
FIT BOARD
(A) RELEASE TWO TABS

Fig. 2-7

4 Rear Panel / WYC Board / BAT Board / REA Board / MA Board

★1 : This screw have a different shape from other screws.

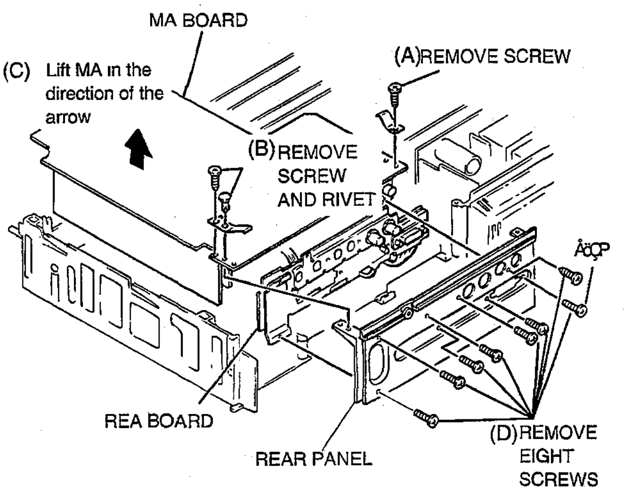

MA BOARD
(C) Lift MA in the direction of the arrow
(A)REMOVE SCREW
(B)REMOVE SCREW AND RIVET
ÅöÇP
REA BOARD
REAR PANEL
(D)REMOVE EIGHT SCREWS

Fig. 2-8

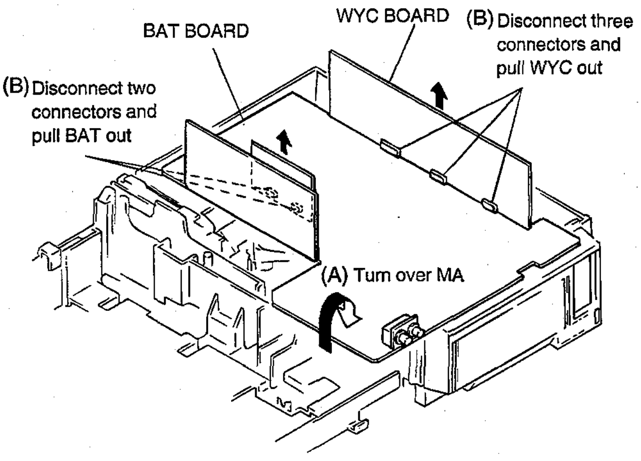

BAT BOARD
WYC BOARD
(B) Disconnect three connectors and pull WYC out
(B) Disconnect two connectors and pull BAT out
(A) Turn over MA

Fig. 2-9

5 PRE Board / PTR Board / PUR Board

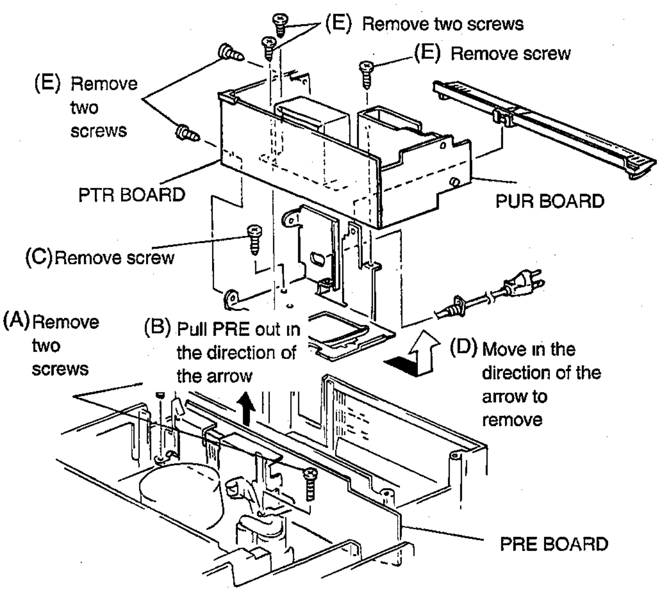

(E) Remove two screws
(E) Remove screw
(E) Remove two screws
PTR BOARD
PUR BOARD
(C)Remove screw
(A)Remove two screws
(B) Pull PRE out in the direction of the arrow
(D) Move in the direction of the arrow to remove
PRE BOARD

Fig. 2-10

6 Cassette Holder / AF Mechanism

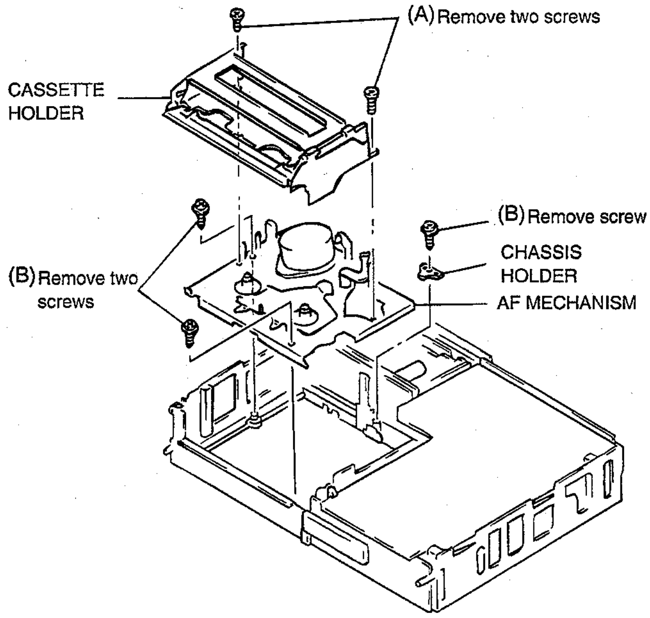

(A)Remove two screws
CASSETTE HOLDER
(B)Remove screw
CHASSIS HOLDER
(B)Remove two screws
AF MECHANISM

Fig. 2-11

7 MWB Board

★1 : When reinstalling the mode gear, be sure to match its phase (position) .
(See the AF mechanism edition.)

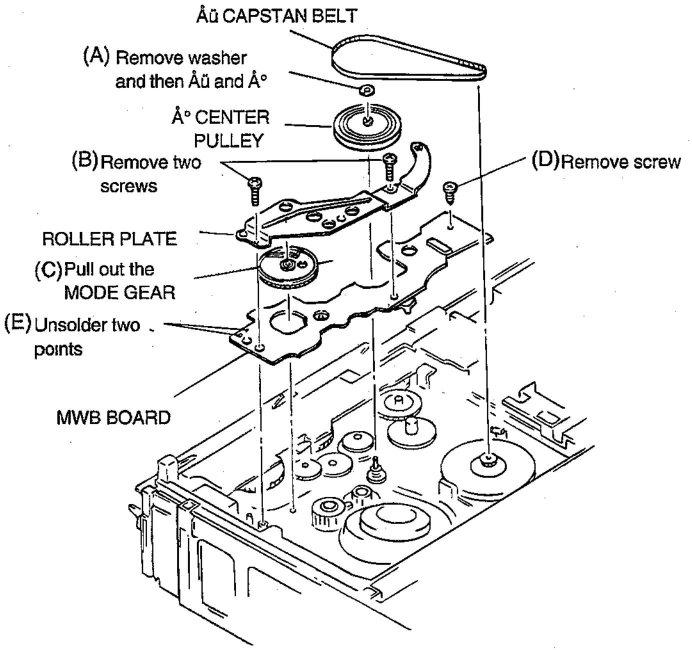

Åû CAPSTAN BELT
(A) Remove washer and then Åû and Å°
Å° CENTER PULLEY
(B)Remove two screws
(D)Remove screw
ROLLER PLATE
(C)Pull out the MODE GEAR
(E)Unsolder two points
MWB BOARD

Fig. 2-12

2.MECHANISM SECTION

The AF mechanism is used as the mechanical section of this VCR. Refer to the following manual when dismantling the mechanical section.

◆ AF Mechanism edition (No.4412E) "CHAPTER 1 DISASSEMBLY"

1.PHOTOS OF MECHANISM (Refer to these photos when reinstalling)

1) Top view of Mechanism

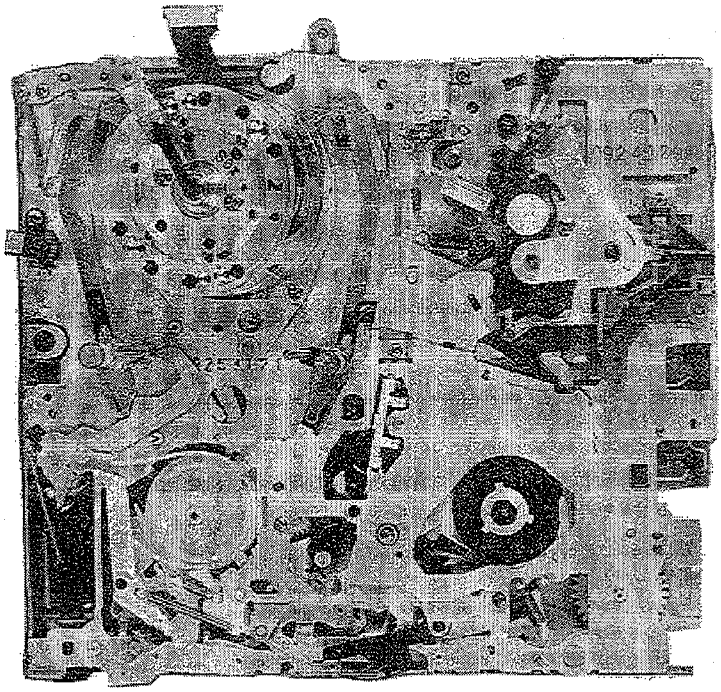


Fig. 2-13

2) Bottom view of Mechanism

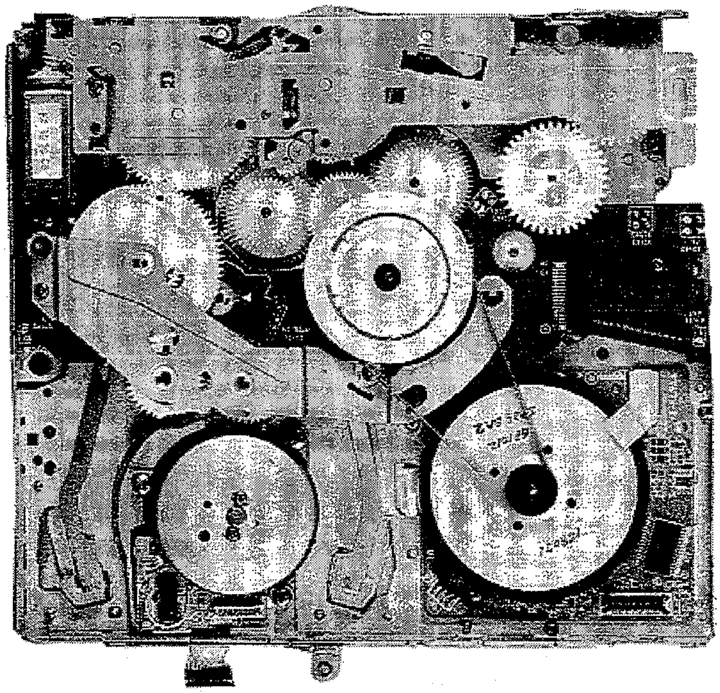


Fig. 2-14

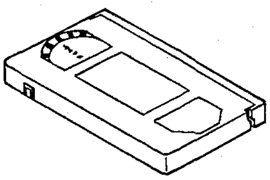
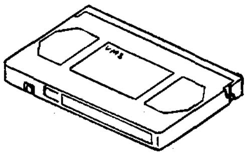
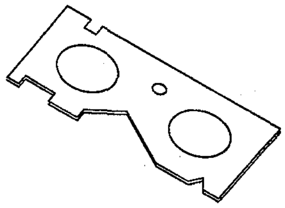
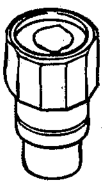
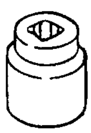
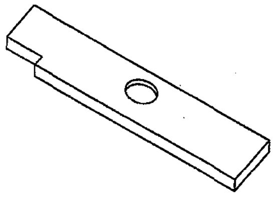
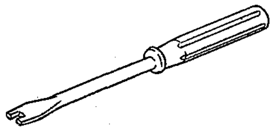
MEMO

CHAPTER 3 MECHANICAL ADJUSTMENT

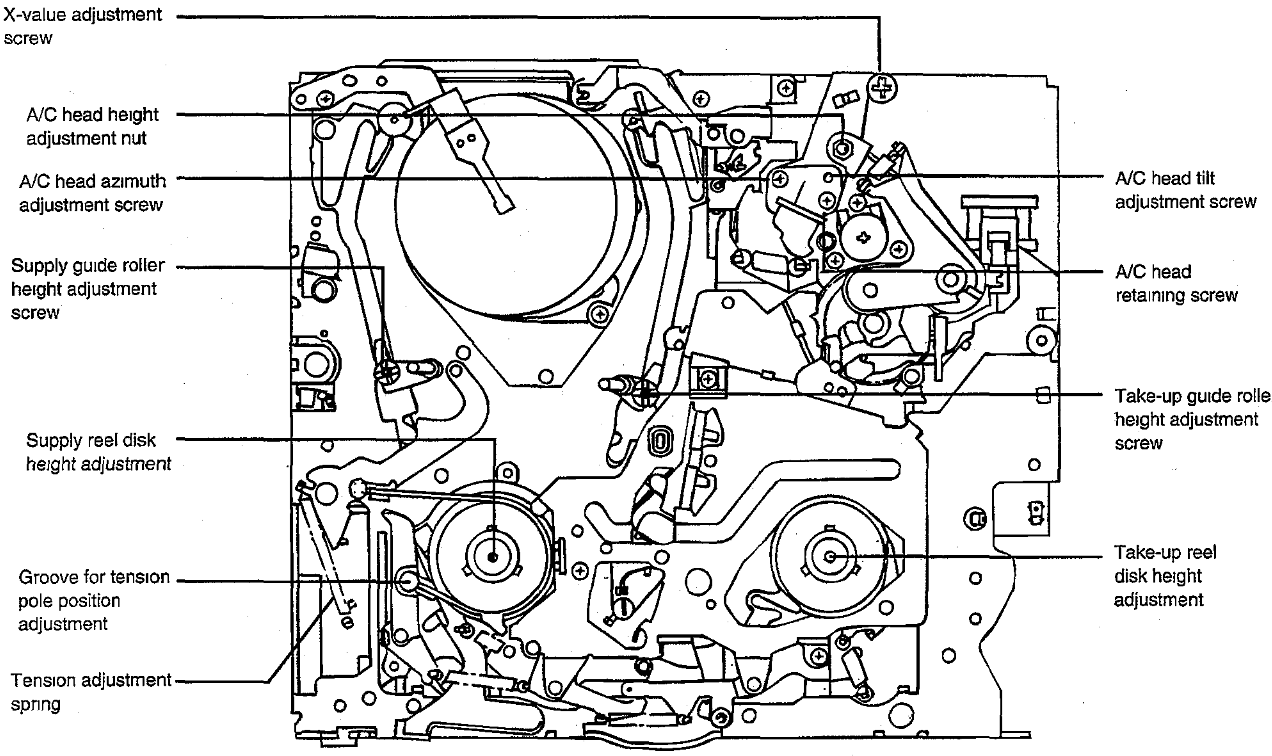
The AF mechanism is used as the mechanical block this VCR. Refer together with the following manual for mechanism adjustment.

◆ AF Mechanism edition (No.4412E) "CHAPTER 2 MECHANICAL ADJUSTMENT"
"CHAPTER 3 MAINTENANCE AND INSPECTION"

1. JIGS AND TAPES FOR ADJUSTMENT

1. Back Tension Meter Part No.709904 	**2.** MH-2 Alignment Tape Part No. 7099052 	**3.** Master Plane No. 7099279 	**4.** Torqu`Gauge Part No. 7099039 
5. Torque Gauge Adapter No. 7099035 	**6.** Reel Disk Height jig Part No. 7099038 	**7.** Guide Roller Adjustment Screw-driver Part No. 7069064 	

2. ADJUSTMENT PARTS LOCATIONS


X-value adjustment screw
A/C head height adjustment nut
A/C head azimuth adjustment screw
Supply guide roller height adjustment screw
Supply reel disk height adjustment
Groove for tension pole position adjustment
Tension adjustment spring
A/C head tilt adjustment screw
A/C head retaining screw
Take-up guide roller height adjustment screw
Take-up reel disk height adjustment

Note : For X-value adjustment, refer to the chapter on electrical adjustment in the service manual of each model.

Fig. 3-1 Top View of Mechanism

3. ADJUSTMENT PROCEDURE

3-1. Mechanical Parts Adjustment

1) Mechanism state switch adjustment

Purpose

To detect the mechanism state correctly and prevent malfunctions.

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
Blank tape	————————	· Eject mode (with the cassette ejected)	· Mechanism state switch · Mode gear

Adjustment procedure

1) Check that arrow (A) on the Sensor (MWB) P.C.B and the arrow of mechanism state switch indication number 1 are aligned.
2) If the above alignment is not obtained, adjust as follows.
   1. Remove the roller plate and mode gear. (See "AF MECHANISM COMPONENTS REMOVAL" in CHAPTER 1.)
   2. Turn the mechanism state switch through the hole in the Sensor (MWB) P.C.B to align arrow (A) on the Sensor (MWB) P.C.B and the arrow of mechanism state switch indication number 1.
   3. Reinstall the mode gear so that mark (B) on the mechanism state switch and mark (C) on the mode gear are aligned.
3) Load a blank tape and perform various operations to check that loading and unloading are performed correctly.

● Adjustment diagram

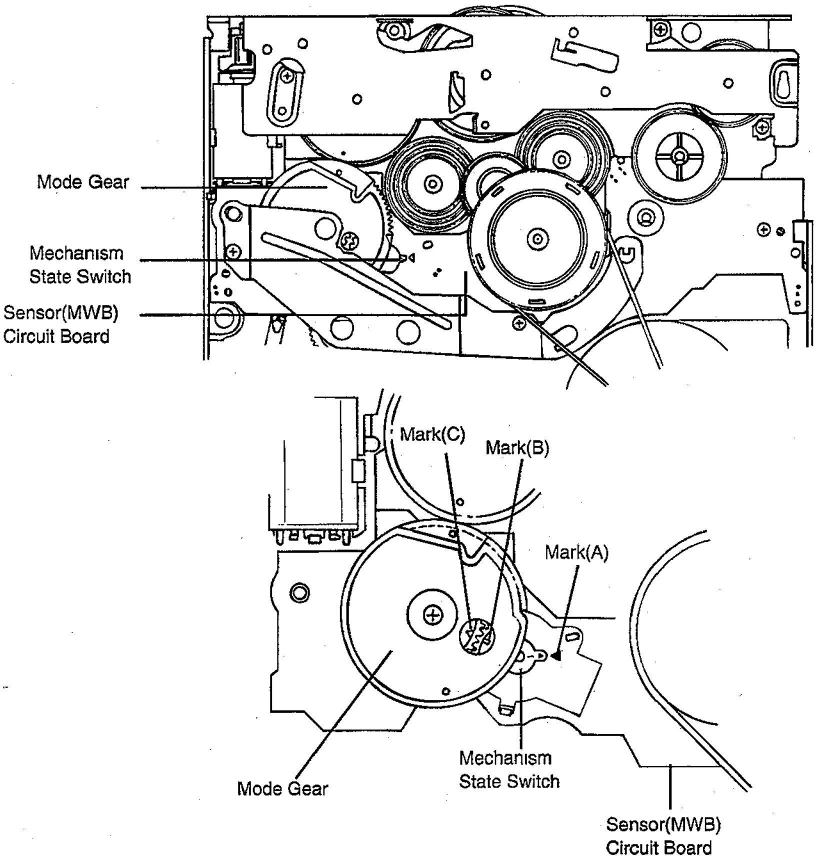

Mode Gear
Mechanism State Switch
Sensor(MWB) Circuit Board
Mark(C)
Mark(B)
Mark(A)
Mode Gear
Mechanism State Switch
Sensor(MWB) Circuit Board

Fig. 3-2

3-2. Tape Transport System Parts Adjustment

The tape transport system is the path from the supply reel disk passing through the video heads to the take-up reel disk. The transport system parts, especially the parts which directly come into contact with a tape, should be kept clean without scratches, dust, oil, etc. The tape transport system has been adjusted before the unit is shipped from the factory. Therefore, when parts in the transport system are replaced, the transport system is stabilized by only adjusting the new parts correctly.

1) Reel disk height adjustment

Purpose .
To set the reels of the cassette to the specified height, thus determining the height of tape.

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
· Master plane (Parts No.7099279) · Reel disk height jig (Parts No.7099038)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	————	· Washers in the supply and take-up reel disks

● Adjustment procedure

1) Check that the reel disk is between sections A and B of the reel disk height jig.
2) If the disk is not between sections A and B of the jig, replace the washers (0.5mm thick) in the reel disk or adjust them.

【Replacement Method】

1) Remove the tension arm and tension band.
2) Remove the upper plate.
3) Remove the supply or/and take-up main brakes.
4) Remove the supply or/and take-up sub brakes.
5) Lift the reel disk (s) and replace the washers or adjust their number.

【Caution】

When the tension arm and tension band are removed, adjust the tension pole position and tension after reinstalling them.

● Adjustment diagram

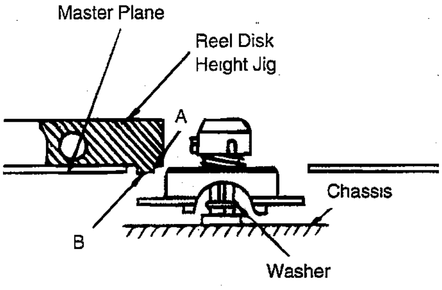


Fig. 3-3

2)Tension pole position and tension adjustment

Purpose

To set the reels of the cassette to the specified height, thus determining the height of tape.

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
Position adjustment ·	——————	Position adjustment . 1) Remove the top cover. 2) Set the VCR to the loading state without inserting a cassette. (See Mechanism Operation Check)	Position adjustment . Groove for tension position adjustment.
Tension adjustment · · Back Tension Meter (Part No.7099004)		Tension adjustment : 3) Play the back-tensionmeter	Tension adjustment : Tension spring hooking position.

● Adjustment procedure

- Position Adjustment -

1) Hook the tension spring to position (B)
2) Insert a flat-bladed screwdriver into the groove for the tension position adjustment and set the clearance between the tesion arm and chassis end to 0 to -1.0mm.
3) After adjustment is completed, perform loading without inserting a cassette and recheck the tension pole position.

- Tension Adjustment -

1) Hook the tension spring to position (B)
2) Changing the tension arm position with this adjustment varies the back-tension torque value. Check the tension arm position without loading a tape and then play the back-tension meter to check that the torque is as follows.

- When the tension arm is positioned -0.5mm to -1mm from the chassis :
  Reading of Back-Tension Meter : 29 to 40 g-cm (reference value)
- When the tension arm is positioned ± 0 mm to -0.5mm from the chassis :
  Reading of Back-Tension Meter . 25 to 35 g-cm (reference value)

3) If the reading is higher than the reference, move the spring to position (A) .
   If the reading is lower than the reference, move the spring to position (C) .

Caution : If the tension torque value has been drifted greatly (more than 6 g-cm) from the reference, recheck the tension pole position. If it is drifted, readjust the tension pole position and tension.

● Adjustment diagram

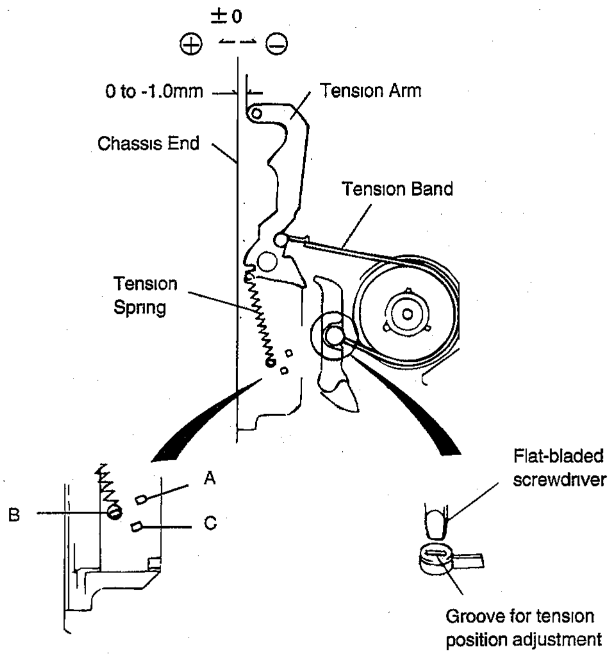


Fig. 3-4

3)Guide roller height adjustment

Purpose : To regulate the height of tape so that the bottom of tape runs along the tape guide line on the cylinder.

Coarse Adjustment

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
· Master plane (Part No.7099279) · Reel disk height jig (Part No.7099038) · Adjustment screw-driver (Part No.7069064)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	————	Height adjustment screws on the supply and take-up guide rollers.

● Adjustment procedure

1) Align the bottom of the guide roller's upper flange and the top of the reel disk height jig.
2) Perform the precise adjustment continuously.

● Adjustment diagram

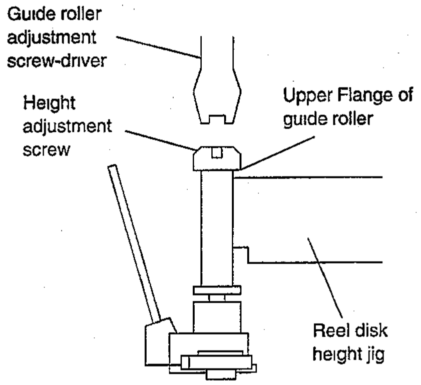

Guide roller adjustment screw-driver
Height adjustment screw
Upper Flange of guide roller
Reel disk height jig

Fig. 3-5

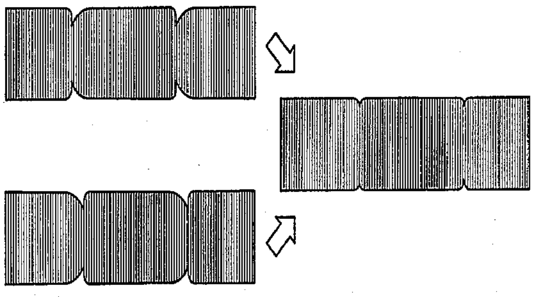
Precise Adjustment

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
· Oscilloscope · Alignment tape	· CH-1 : TP1526 [MA board] · CH-2 . TP1606 [MA board] ————	· Play alignment tape. (Color bars section)	· Guide roller height adjustment screws.

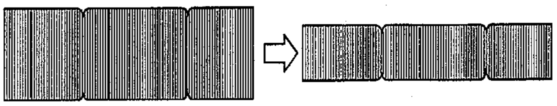
● Adjustment procedure

1) Play the alignment tape · Tracking control at center. (when this adjustment is performed after the cylinder has been replaced, set the tracking so that the FM output is maximum.)
2) Height adjustment screw : Flatten the FM envelope.
3) Turn the tracking control volume.
4) Check that the FM drops at the start and end of FM envelope are uniform.

● Waveforms



Turn the guide.roller height adjustment screw slightly to flatten the waveform.



Tracking control center.

Turn the tracking control volume.

Fig. 3-6

4)Audio / Control (A/C) head adjustment

Purpose : To keep the contact between the tape and head even so the specified track is recorded and played back.

Coarse Adjustment

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
· Blank tape	————————	· Run the blank tape.	· A/C head retaining screw · Azimuth adjustment screw · Height adjustment nut · Tilt adjustment screw

● Adjustment procedure/adjustment diagrams

1) A/C head retaining screw : Check that the spring section of the A/C head retaining screw protrudes 5.8 ± 0.15mm over the top of head base (1)

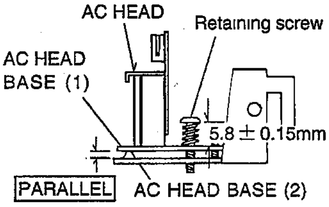

AC HEAD
Retaining screw
AC HEAD BASE (1)
5.8 ± 0.15mm
PARALLEL
AC HEAD BASE (2)

Fig. 3-7

2) Tilt adjustment screw and azimuth adjustment screw : Make head bases (1) and (2) parallel.

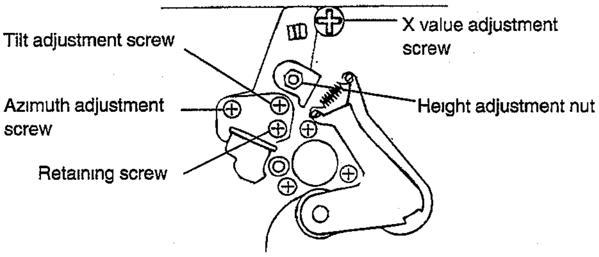

Tilt adjustment screw
X value adjustment screw
Azimuth adjustment screw
Height adjustment nut
Retaining screw

Fig. 3-8

3) Height adjustment nut Adjust the height of A/C head base (1) so that its top surface is approx. 2.6 mm lower than the bottom flange of the take-up guide pole.

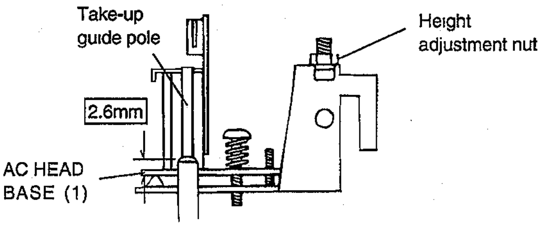

Take-up guide pole
Height adjustment nut
2.6mm
AC HEAD BASE (1)

Fig. 3-9

4) Load a blank tape and set the VCR to the play mode.

5) Check that there is no conspicuous curling and riding over of tape around the A/C head. If there is conspicuous curling or riding over, readjust the tilt adjustment screw, azimuth adjustment screw and height adjustment nut.

When the bottom edge of tape is 0.25 from the bottom edge of the control head's core, the height of A/C head is ideal.

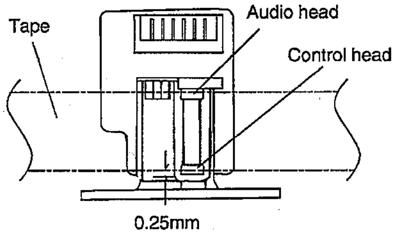

Tape
Audio head
Control head
0.25mm

Fig. 3-10

6) Perform the precise adjustment continuously.

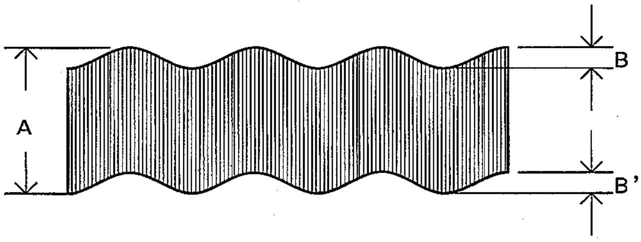
Precise Adjustment

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
· Oscilloscope · Alignment tape	· Audio out jack ————————	· Play alignment tape. (Color bars section)	· Azimuth adjustment screw · Height adjustment nut · Tilt adjustment screw.

● Adjustment procedure

1) Adjust the azimuth adjustment screw, height adjustment nut and tilt adjustment hexagonal screw slightly and alternately : Make the audio output maximum and flat (minimum fluctuations) .

● Waveforms



.A : Maximum B B' . Minimum

Fig. 3-11

5)Adjustments after replacing cylinder

Purpose :
To eliminate drift in the height relative to the guide rollers and drift in the X value, etc. However, these drifts should be minimum if the cylinder is replaced correctly.

Test Equipment/Jigs	Preparation for Adjustment	State of VCR	Adjustment Point
· Oscilloscope	· CH-1 : TP1526 [MA board] · CH-2 : TP1606 [MA board]	· Run the blank tape.	· Guide rollers (precise djustment on page 2-5) 〔Electrical adjustment〕 · Head switching point · X-value
· Alignment tape		· Play alignment tape (Stairsteps section)	
· Blank tape	――――		

● Adjustment procedure

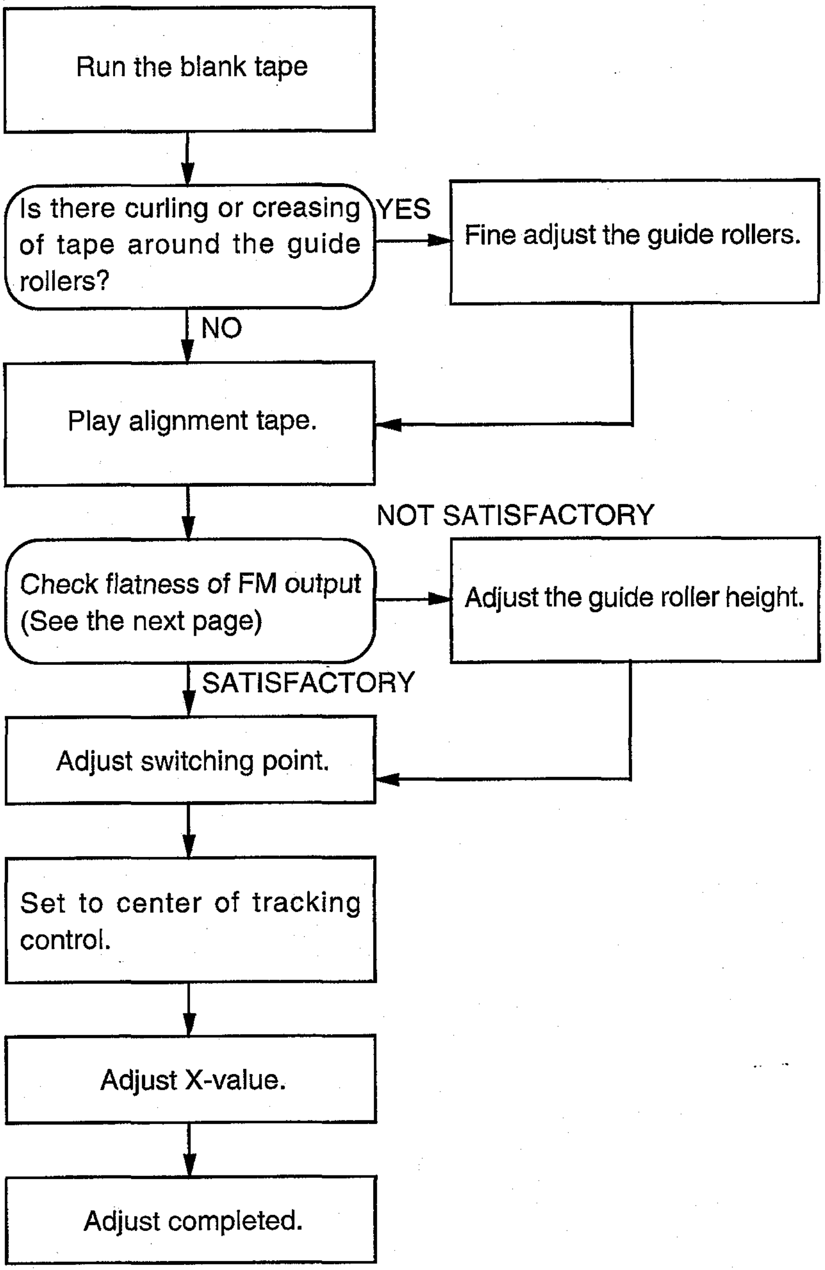

Run the blank tape
Is there curling or creasing of tape around the guide rollers?
YES
Fine adjust the guide rollers.
NO
Play alignment tape.
NOT SATISFACTORY
Check flatness of FM output (See the next page)
Adjust the guide roller height.
SATISFACTORY
Adjust switching point.
Set to center of tracking control.
Adjust X-value.
Adjust completed.

Fig. 3-12

Checking procedure of the flatness and fluctuations of FM output and waveform diagrams

1) Use the tracking control to maximize the FM output.

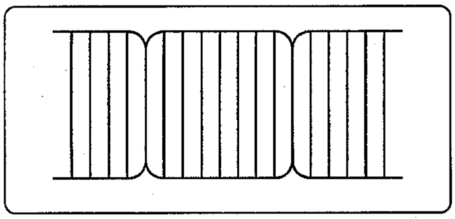


Fig. 3-13

2) Fine tune the voltage level range of the oscilloscope to set the FM output to 4 graduations.

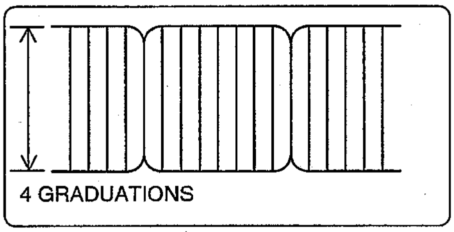


Fig. 3-14

3) Adjust the tracking to set the maximum amplitude of the FM output to 3 graduations.

4) Check that the minimum amplitude is more than 2 graduations.

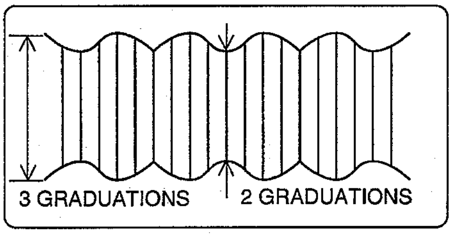


Fig. 3-15

5) Check that the level fluctuations between the maximum and minimum amplitudes are less than 13%.

6) Tension/Torque checks

Purpose .

It is necessary to check the tension, torque and compression force at the tape take-up section and moving section to make the tape running smooth and satisfy the basic performance of the VCR. Check these if the tape running is not smooth or the tape speed is abnormal.

Test Equipment/Jigs	State of VCR
· Torque gauge · Torque gauge adapter	· Set the VCR to each operation mode without inserting a cassette. (See Mechanism Operation Check)

Item	VCR operation mode	Measured reel	Measured value
Main brake torque	Stop (Note)	Supply & take-up reels	100 ~ 250 g · cm
Slack removal torque	Unloading	Supply reel	120 ~ 250 g · cm
Fast forward torque	Fast forward	Take-up reel	400 g · cm or more
Rewind torque	Rewind	Supply reel	400 g · cm or more
Take-up torque	Play	Take-up reel	40 ~ 70 g · cm
Back-tension torque	Fast forward/Rewind	Supply & take-up reel	3 ~ 13 g · cm
Reverse torque	Reverse	Supply reel	160 ~ 350 g · cm
Reverse play torque	Reverse play	Supply reel	160 ~ 250 g · cm
Slow torque	Slow	Take-up reel	25 ~ 70 g · cm

● Checkimg method

Place the torque gauge and torque gauge adapter on the reel disk and hold the torque gauge with your fingers.

Note : To fit the main brakes to the supply and take-up reel disks, set the VCR to the loading state without loading a cassette and wait for one minute in the LOADING-STOP mode. The mechanism state switch will be shifted from indication "6" to "4" Check that the main brakes are engaged with the reel disks in this condition and then perform measurement.

● Adjustment diagram

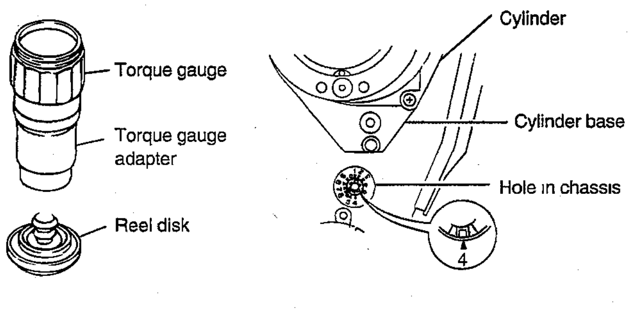


Fig. 3-16

CHAPTER 4 ELECTRIC CIRCUIT ADJUSTMENT

1.Circuit Board Locations and Adjustment / Service Position

The electrical adjustments other than the 8.42MHz VCO adjustment can be done when only the top cover is removed.

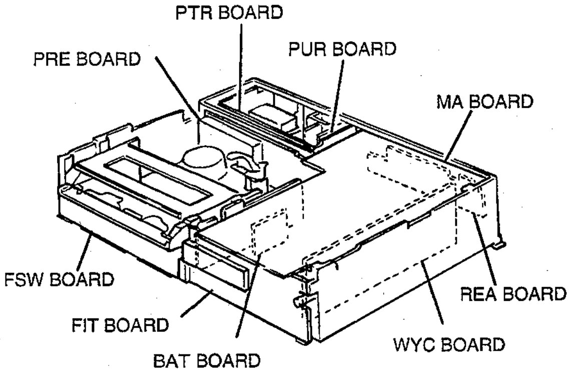


Fig. 4-1

2.Test Equipment and Tapes Necessary for Adjustments

1) Dual-trace oscilloscope
2) Colour bar generator
3) Colour monitor TV (with A/V jacks)
4) Digital voltmeter (DVM)
5) VTVM
6) Alignment tape (MH-2 · Parts No.7099052)
7) Blank tape

3.Before Starting Adjustment

1) The following conditions apply when otherwise not specified.
   - Oscilloscipe probe → 10 : 1
   - Oscilloscope synchronisation → Internal sync
   - Ground of test equipment → TP1527 (MA board)
2) When performing more than one adjustment, follow the order of times shown here.

4.Preset Position of Switches and Controls During Adjustment

1) Positions of controls

· SHARPNESS CONTROL	:	Optimum position
· TRACKING	.	Center
· SLOW TRACKING	:	Center
· V.LOCK	:	Optimum position

2) OSD Setting [SELECTION MENU]

· VIDEO MODE	AUTO
· SEARCH SPEED	× 5
· DISPLAY	WHITE
· CAMERA SW	12~

※ · The OSD positions are set at the factory above.

5.Procedure to Reset (Initialize) the VCR

This VCR can be reset to the state set at the factory by the following procedure.

Table. 4-1

	IC	Procedure	Object to be reset
1	System control μ P (IC1901)	Press S1303	System control μ P
2	Main μ P (IC1701)	Press S1303 and S1311 simultaneously	· Timer · OSD settings
3	EEP ROM (IC1702)	Press REV.PLAY SET and ALARM RESET simultaneously	· Trouble memory · Cylinder use time (◆) · Total use time

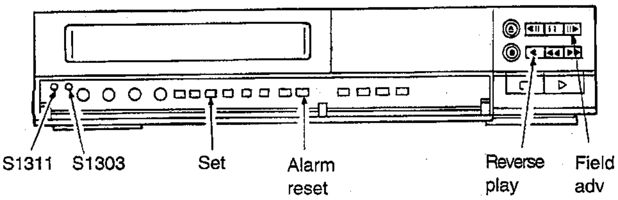


Fig. 4-2

◆ : Cylinder time of use

This VCR has function which displays the accumulated time of cylinder rotation as a reference for cylinder replacement. Be careful as all data including the accumulated time is cleared when the EEP ROM is initialized.

The following shows the display of the cylinder time of use and how to reset it without resetting other values.

- Display method (the total use time is also displayed)
  Press F.ADV and SET simultaously (displayed in the OSD) .
- Resetting the time of use only
  Short IC1701 (Main μ P) pin 16 to ground.

6.Connecting Test Equipment

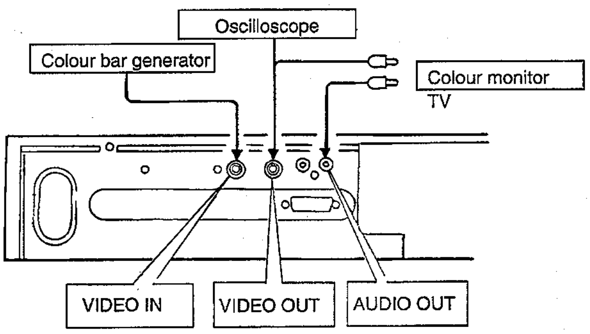
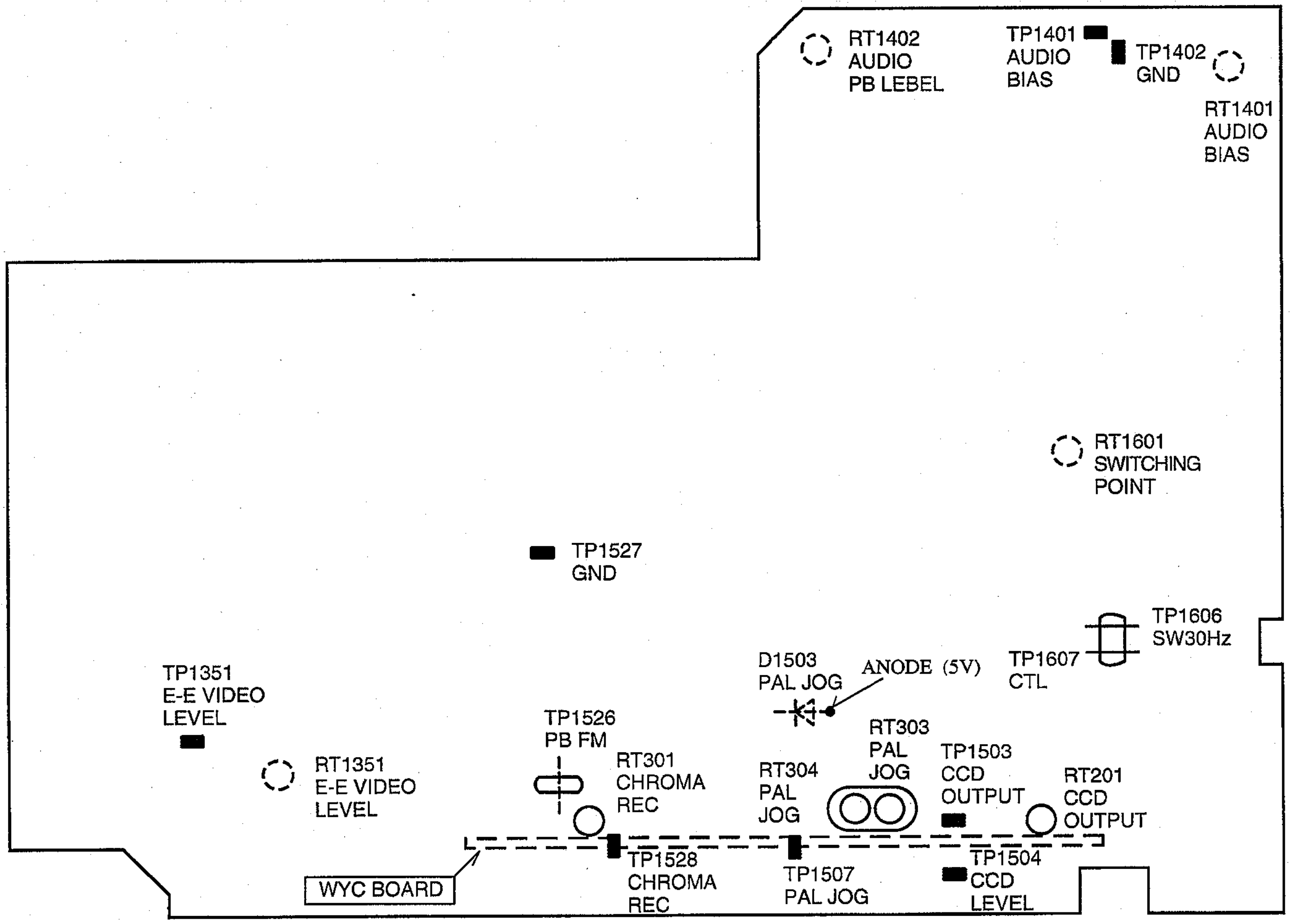


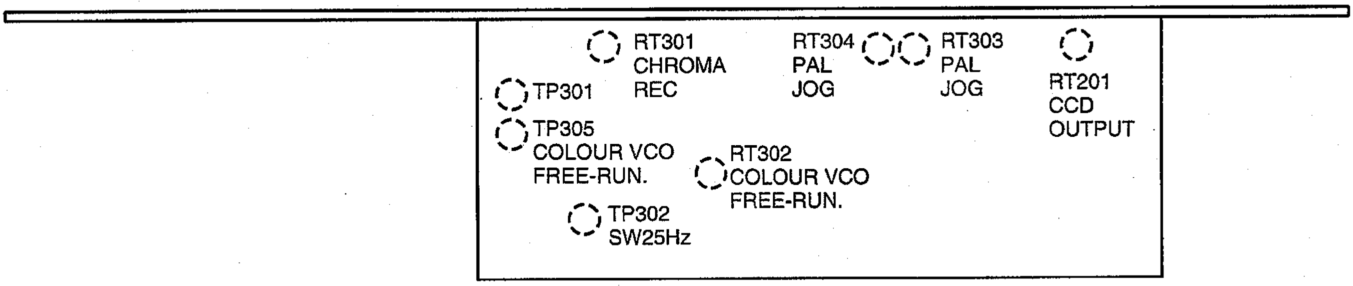
Fig. 4-3

7.Location of Components on Circuit Boards



RT1402
AUDIO
PB LEBEL
TP1401
AUDIO
BIAS
TP1402
GND
RT1401
AUDIO
BIAS
RT1601
SWITCHING
POINT
TP1527
GND
TP1606
SW30Hz
TP1607
CTL
D1503
PAL JOG
ANODE (5V)
TP1351
E-E VIDEO
LEVEL
TP1526
PB FM
RT303
PAL
JOG
TP1503
CCD
OUTPUT
RT1351
E-E VIDEO
LEVEL
RT301
CHROMA
REC
RT304
PAL
JOG
RT201
CCD
OUTPUT
WYC BOARD
TP1528
CHROMA
REC
TP1507
PAL JOG
TP1504
CCD
LEVEL

Fig. 4-4 Main (MA) Circuit Board [Side B]



RT301
CHROMA
REC
RT304
PAL
JOG
RT303
PAL
JOG
RT201
CCD
OUTPUT
TP301
TP305
COLOUR VCO
FREE-RUN.
RT302
COLOUR VCO
FREE-RUN.
TP302
SW25Hz

Fig. 4-5 Y/Chroma (WYC) Circuit Board [Side B]

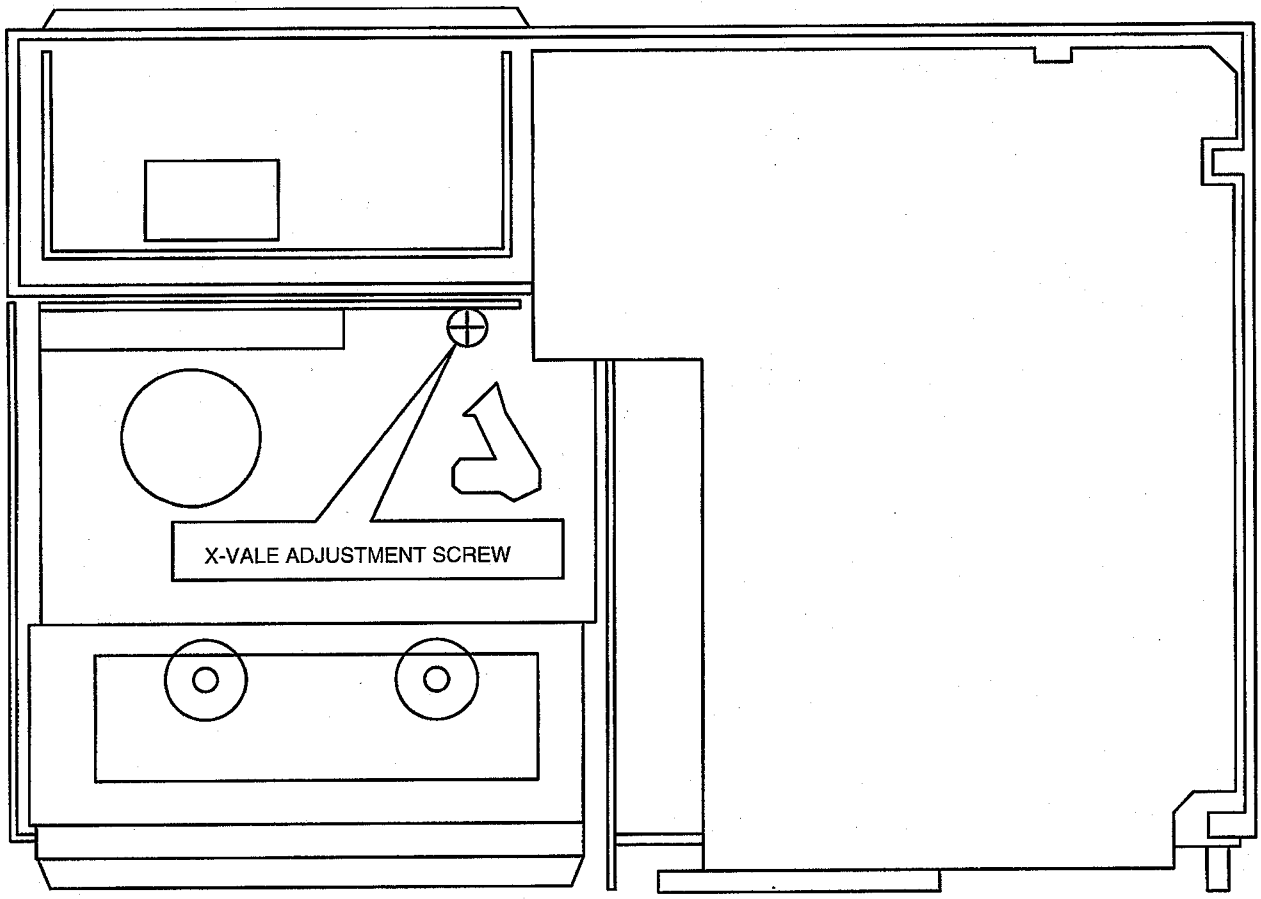

X-VALE ADJUSTMENT SCREW

Fig. 4-6 Top View of Unit

8.Adjustment Procedure

8-1. Servo Circuit Adjustments

(1) Head switching point adjustment (See Fig.4-4)

● Purpose of Adjustment and Fault Occurring if Incomplete

Purpose :

To set the video head switching point during play to approximately the centre where the CH-1 and CH-2 envelopes overlap each other.

Fault :

- The vertical sync signal is degraded and vertical jitter occurs.
- Switching noise appears across the bottom of the screen.

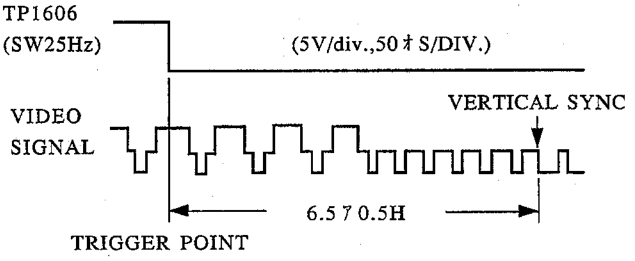
Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· Oscilloscope	· CH-1 : Video Out · CH-2 : TP1606 [MA board]	· Play alignment tape (03 mode) · Tracking volume : Center	· RT1601 [MA board]
· Alignment tape			

● Adjustment procedure

1) Vertical sync signal. Set to 6.5 ± 0.5H from the trailing edge (trigger position) of the SW30Hz pulse.

<<Setting of oscilloscope>>
- Trigger with CH-2.
- Set the sync slope to "-".

● Waveforms



(2) X-Value adjustment (See Fig.4-6)

● Purpose of Adjustment and Fault Occurring if Incomplete

Purpose :

To obtain compatibility with other VCRs.

Fault :

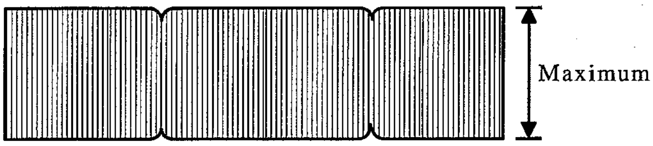
Noise occurs when tape recorded by another VCR is played back.

Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· Oscilloscope	· CH-1 : TP1526 [MA board] · CH-2 : TP1606 [MA board]	· Play alignment tape (03 mode) · Tracking volume : Center	· X-value adjustment screw
· Alignment tape			

● Adjustment procedure

1) Turn the X-value adjustment screw to maximize the FM output.

● Waveforms



(100mV/div.,20 μ s/div.)

8-2. Video Circuit Adjustments

(1) E-E video level adjustment (See Fig.4-4)

● Purpose of Adjustment and Fault Occurring if Incomplete

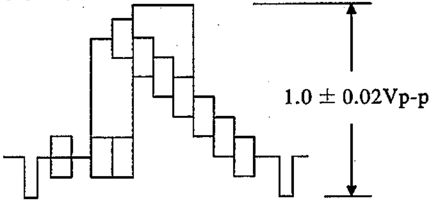
Purpose :	Fault :
To set the video output level in the E-E mode to the specified value.	The correct tint and brightness cannot be obtained.

Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· Oscilloscope	· TP1351 [MA board]	· E-E mode. · Input the colour bar signal.	· RT1351 [MA board]
· Colour bar generator	· VIDEO IN		

● Adjustment procedure

1) Adjust RT1351 so the output level is 1.0 ± 0.02Vp-p.

● Waveforms



(200mV/div.,20 μ s/div.)

(2) Colour VCO free-running adjustment (See Fig.4-5)

● Purpose of Adjustment and Fault Occurring if Incomplete

Purpose :	Fault :
To set the colour VCO frequency to the specified value.	No color.

Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· Frequency counter	· TP305 [WYC board]	· Set the no-signal input state in the eject mode.	· RT302 [WYC board]

● Adjustment procedure

1) Short-circuit TP301 and TP311 (GND) .
2) Short-circuit TP302 and TP311 (GND) .
3) Adjust RT302 so the frequency counter reads 627 ± 5kHz.

(3) CCD level adjustment (Fig. 4-4)

● Purpose of Adjustment and Fault Occurring if Incomplete

Purpose :	Fault :
To align the Y level of the main playback signal and that of the 1H delayed signal.	· The S/N deteriorates. · Dropout cannot be compensated.

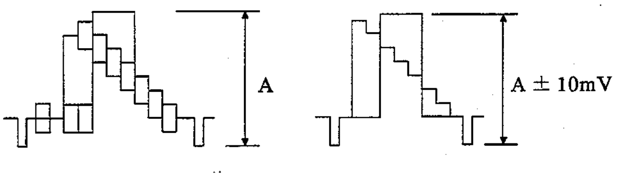
Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· Oscilloscope	· TP1503 [MA board] · TP1504 [MA board]	· Record color bar signal and play it back. (06 mode)	· RT201 [WYC board]
· Alignment tape			

● Adjustment procedure

1) Adjust RT201 so the waveform level at TP1504 becomes ± 10mV of that at TP1503 (section A) .

● Waveforms

(200mV/div.,50ms/div.)



(4) Chroma recording level adjustment (See Fig. 4-4)

● **Purpose of Adjustment and Fault Occurring if Incomplete**

Purpose :
To set the chroma recording level to the optimum value.

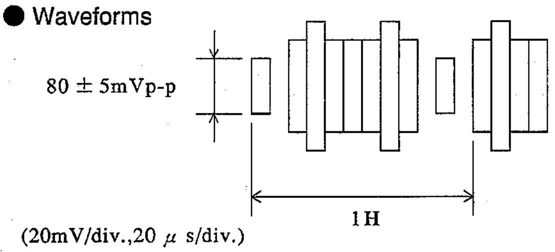
Fault :
Colour becomes defective.

Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· Oscilloscope	· TP1528 [MA board]	· REC mode. (06 mode) · Input the colour bar signal.	· RT301 [WYC board]
· Colour bar generator	· VIDEO IN		
· Blank tape			

● **Adjustment procedure**

1) Adjust RT301 so the chroma burst level is 80 ± 5mVp-p.

● **Waveforms**



(5) PAL Jog adjustment (See Fig. 4-4)

● **Purpose of Adjustment and Fault Occurring if Incomplete**

Purpose :
To set the output signal to the specified phase position.

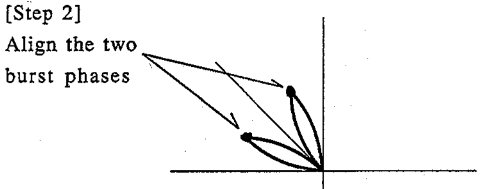
Fault :
Colour becomes defective.

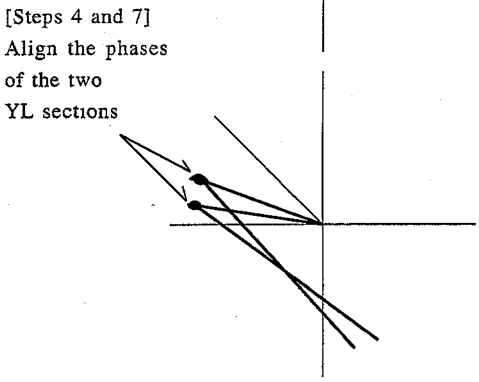
Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· Vectorscope	· Video out	· Play alignment tape. (06 mode/1kHz section)	· RT1402 [MA board]
	· TP1507 [MA board] · D1503 (anode) [MA board] · TP1527 [MA board]		

● **Adjustment procedure**

1) Connect a vectorscope to video out. (Set the vectorscope to the +V mode.)
2) Align the two burstphases.
3) Short-circuit TP1507 and D1503 (anode : 5V) .
4) Adjust RT303 to align the phases of the two vectors in the YL section.
5) Release the short-circuit.
6) Short-circuit TP1507 and TP1527 (GND) .
7) Adjust RT304 to align the phases of the two vectors in the YL section.
8) Release the short-circuit.
9) Repeat steps 3) and 4) .

● **Waveforms**


[Step 2]
Align the two burst phases


[Steps 4 and 7]
Align the phases of the two YL sections

8-3.Audio Circuit Adjustment

(1) Audio bias level adjustment (See Fig. 4-4)

● Purpose of Adjustment and Fault Occurring if Incomplete

Purpose :
To set the recording bias level to the optimum value.

Fault :
- High-frequency response deteriorates.
- Sound tends to be distorted.

Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· VTVM	· TP1401 [MA board] · TP1402 [MA board]	· No-signal record mode. (03 mode)	· RT1401 [MA board]
· Blank tape			

● Adjustment procedure

1) Adjust RT1401 so the VTVM reads 2.7 ± 0.1mV.

(2) Audio playback level adjustment (See Fig. 4-4)

● Purpose of Adjustment and Fault Occurring if Incomplete

Purpose :
To set the audio playback level to the specified value.

Fault :
The correct volume cannot be obtained.

Test Equipment/Jigs	Test Equipment Connection Point	State of VCR	Adjustment Point
· VTVM	· Audio out	· Play alignment tape. (03 mode/1kHz section)	· RT1402 [MA board]
· Alignment tape			

● Adjustment procedure

1) Adjust RT1402 so the VTVM reads -8.0 ± 0.5dBs.

9.Trouble Mode Function

This VCR has a function which displays mechanism malfunctions, etc. When the system control μ P (IC1901) detects information on a defect in the mechanism control system, it transfers bit data to the main μ P (IC1701) The trouble memory data written to the EEP ROM can also be displayed on the OSD screen.

9-1. Trouble Mode

Table. 4-2 Details of Error

	Name of error	Major cause
1	Cylinder Lock	SW30Hz is not normal.
2	Mecha.Lock 1	CFG is not detected for more than 400ms during unloading.
3	Mecha.Lock 2~ 9	The object position cannot be detected within the specified time during operation.
4	Reel.Lock 1	The specified CFG is not input when reel lock has occurred.
5	Reel.Lock 2	The specified CFG is input when reel lock has occurred

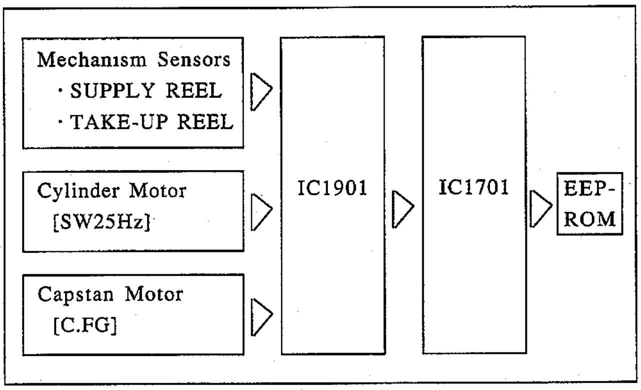

Mechanism Sensors
· SUPPLY REEL
· TAKE-UP REEL
Cylinder Motor
[SW25Hz]
Capstan Motor
[C.FG]
IC1901
IC1701
EEP-ROM

Fig. 4-8 Malfunction Detection

9-2. Trouble Memory Data Display

(1) Display method

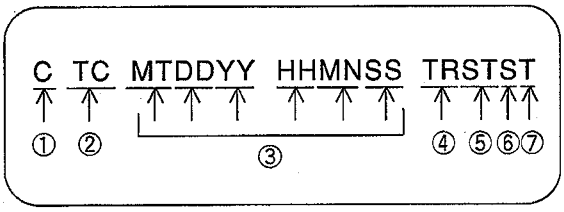

C TC MTDDYY HHMNSS TRSTST
①
②
③
④
⑤
⑥
⑦

Fig. 4-9 OSD Screen

- Procedure to display the trouble memory

  Press STOP , DOWN and H.POS simultaneously.

- Procedure to erase the trouble memory

  Refer to "5.PROCEDURE TO RESET THE VCR" in this chapter.

(2) Datails of display (See Fig.4-9)

1. C : Number of times

Table. 4-3

Display	Details
1	First malfunction
0	Second malfunction

CAUTION : When malfunctions occurr 10 times or more, the first and the last 8th malfunctions are displayed.

2. TC : Total number of times

3.Data when malfunction occurred

→ MT : Month
→ DD : Day
→ YY : Year
→ HH : Hour
→ MN : Minute
→ SS : Second

4. TR : Trouble data

Table. 4-4

Display	DETAILS	MECHA.POSITION
CY	CYLINDER LOCK	
M0	MECHA.LOCK 1	
M1	MECHA.LOCK 2	FL
M2	MECHA.LOCK 3	Unload
M3	MECHA.LOCK 4	Stop
M4	MECHA.LOCK 5	FF/REW
M5	MECHA.LOCK 6	Rec/Play
M6	MECHA.LOCK 7	Slow
M7	MECHA.LOCK 8	Reverse slow
M8	MECHA.LOCK 9	Reverse
M9	MECHA.LOCK 10	Transient
R1	REEL LOCK 1	
R2	REEL LOCK 2	

5. ST : Status

Table. 4-5

Display	Details
ST	Normal stop
F1	FF (when calculating tape remaining)
F2	FF (when executing soft landing)
F3	FF (high-speed state)
R1	REW (when calculating tape remaining)
R2	REW (when executing soft landing)
R3	REW (high-speed state)
RS	Rec Pause
RD	Rec
PS	Still
PL	Play
RP	Reverse play
FA	Field Advance
FR	Field reverse
CU	CUE
RV	Review

6. S : Tape speed

Table. 4-6

Display	Details
0	03
1	12
2	A24
3	24

7. T : Tape position

Table. 4-7

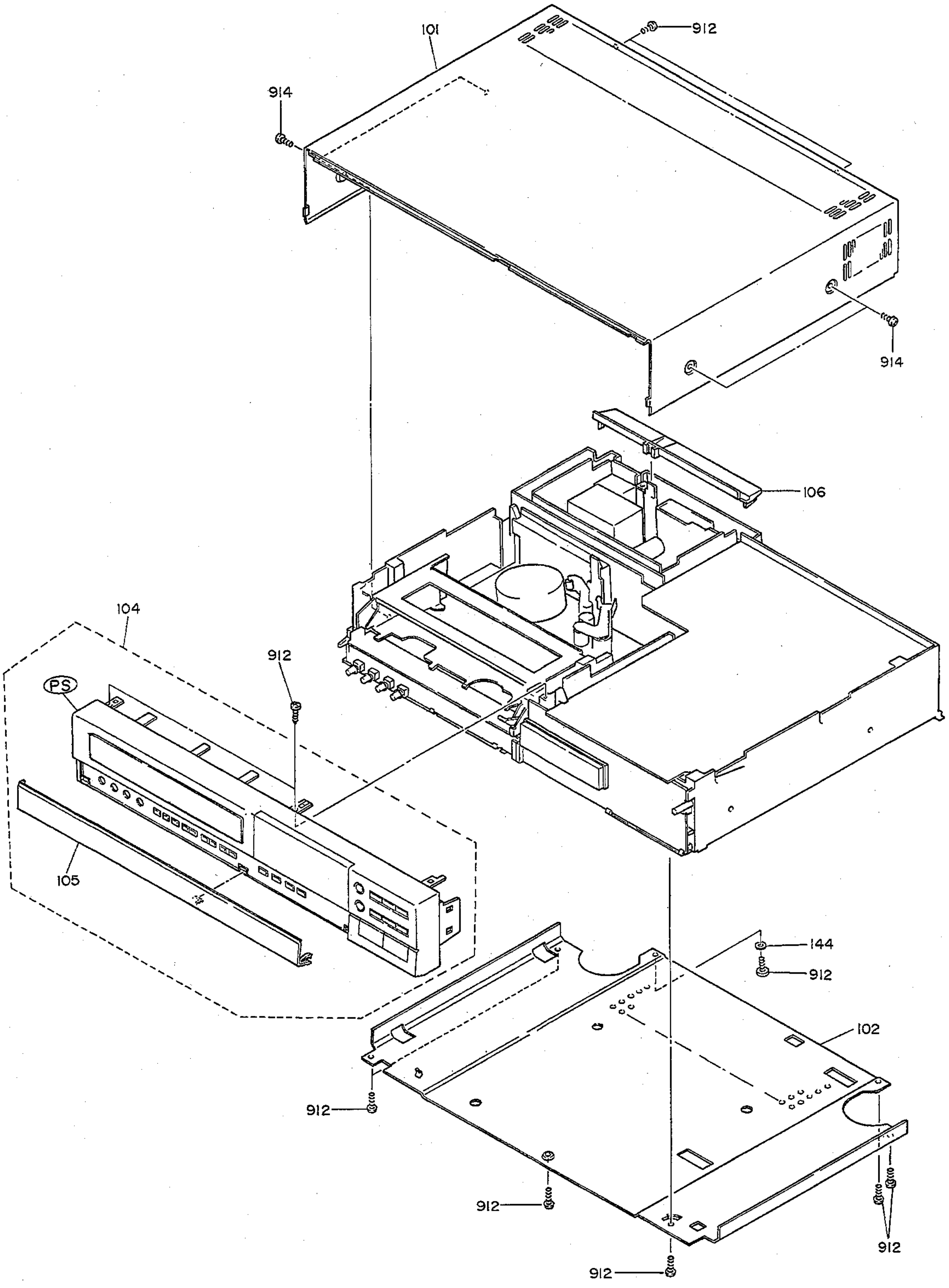
Display	Details
-	Remaining tape calculation incomplete
0	Near the end of tape
1	·
2	·
3	·
4	·
5	·
6	·
7	Near the start of tape

MEMO

EXPLODED VIEWS

1. CABINET (CASES) SECTION

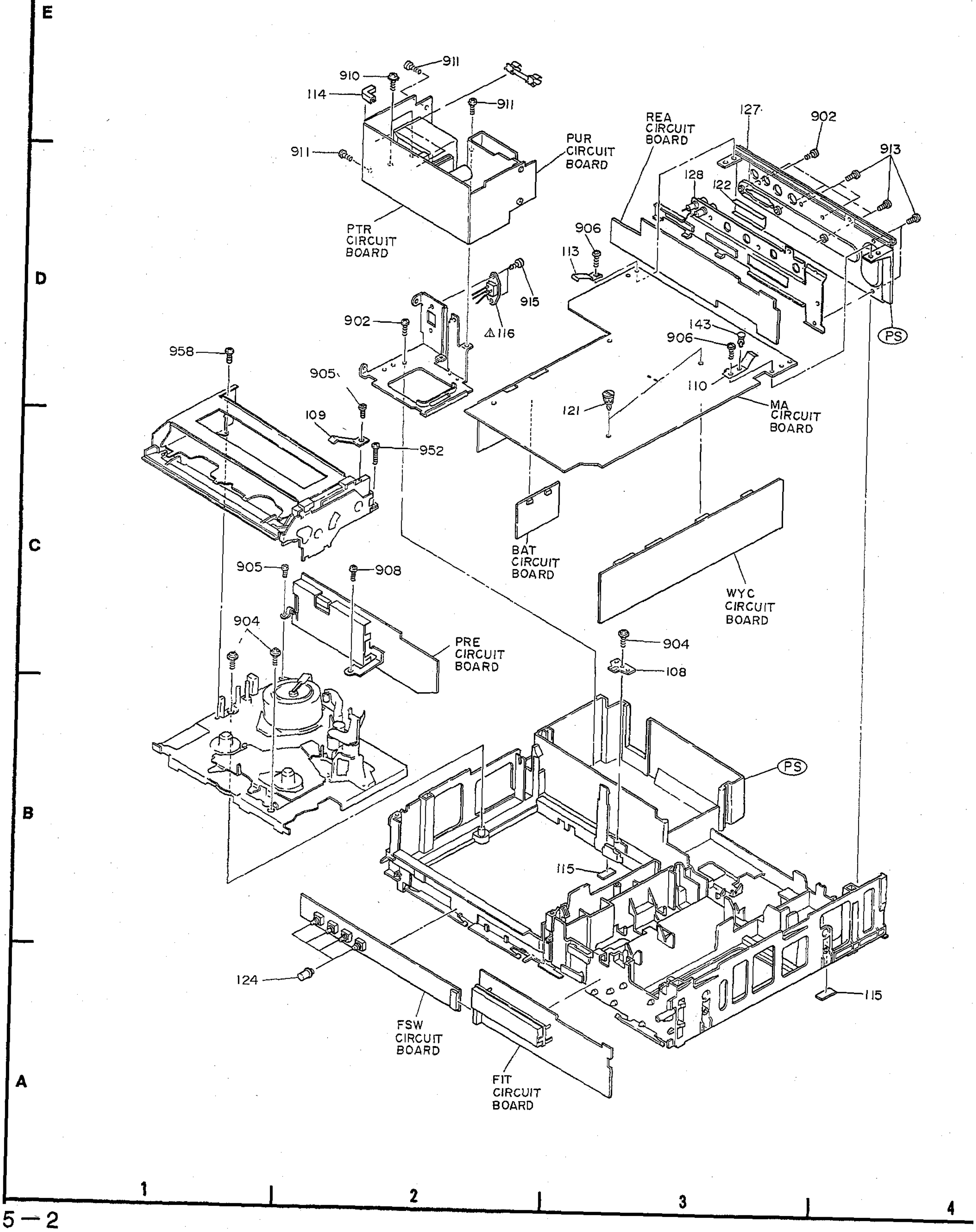
NOTE: The synthetic resin members that can be dismantled are shown by abbreviations using letters.


101
912
914
914
106
104
912
PS
105
144
912
102
912
912
912
912

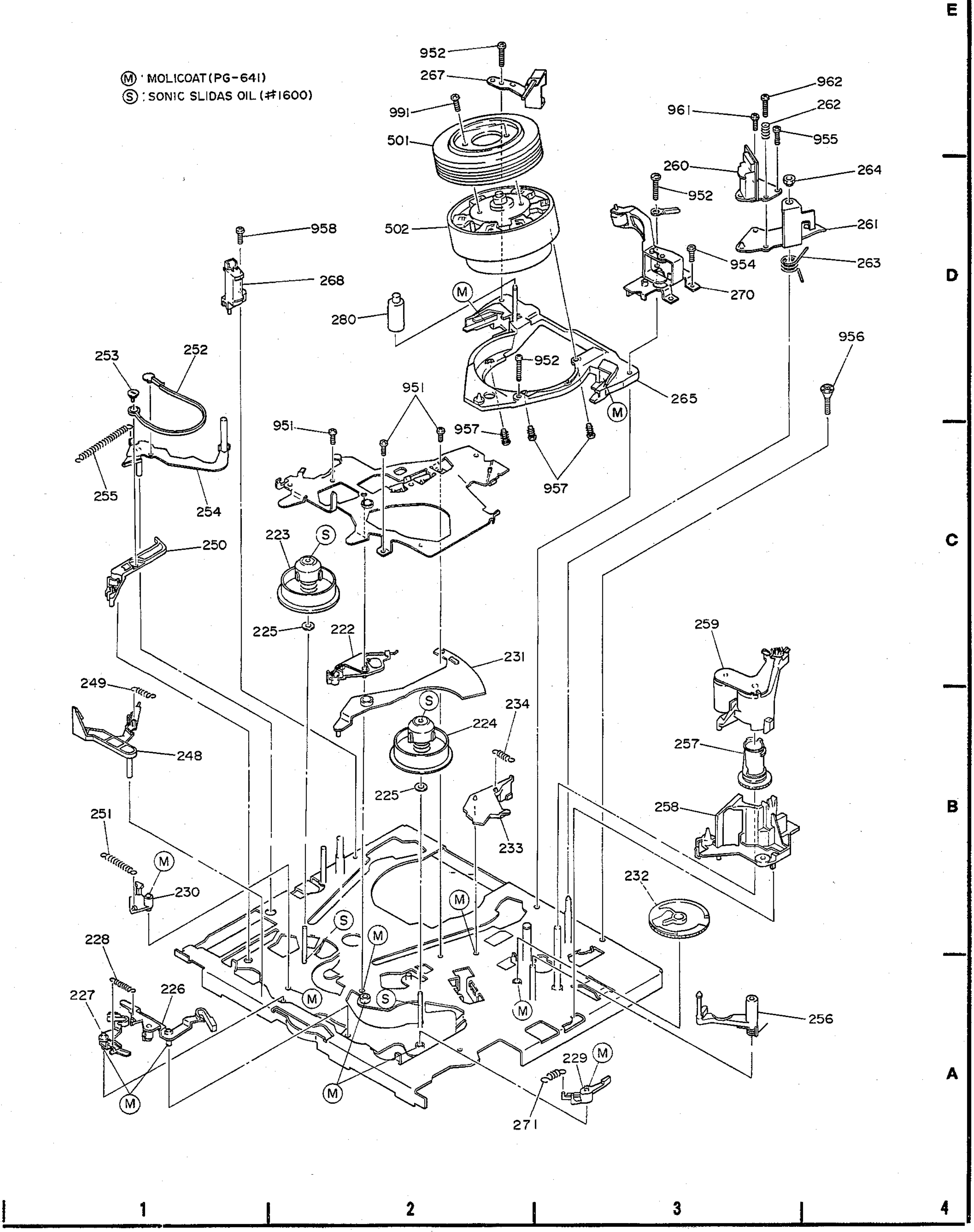
E
D
C
B
A
1
2
3
4

2. CABINET (CIRCUIT BOARDS) SECTION

NOTE: The synthetic resin members that can be dismantled are shown by abbreviations using letters.


E
D
C
B
A
1
2
3
4
910
911
114
911
911
PUR CIRCUIT BOARD
PTR CIRCUIT BOARD
REA CIRCUIT BOARD
127
902
913
128
122
906
113
915
⚠116
902
958
905
109
952
143
906
110
121
MA CIRCUIT BOARD
BAT CIRCUIT BOARD
WYC CIRCUIT BOARD
PS
905
908
904
PRE CIRCUIT BOARD
904
108
PS
115
124
115
FSW CIRCUIT BOARD
FIT CIRCUIT BOARD

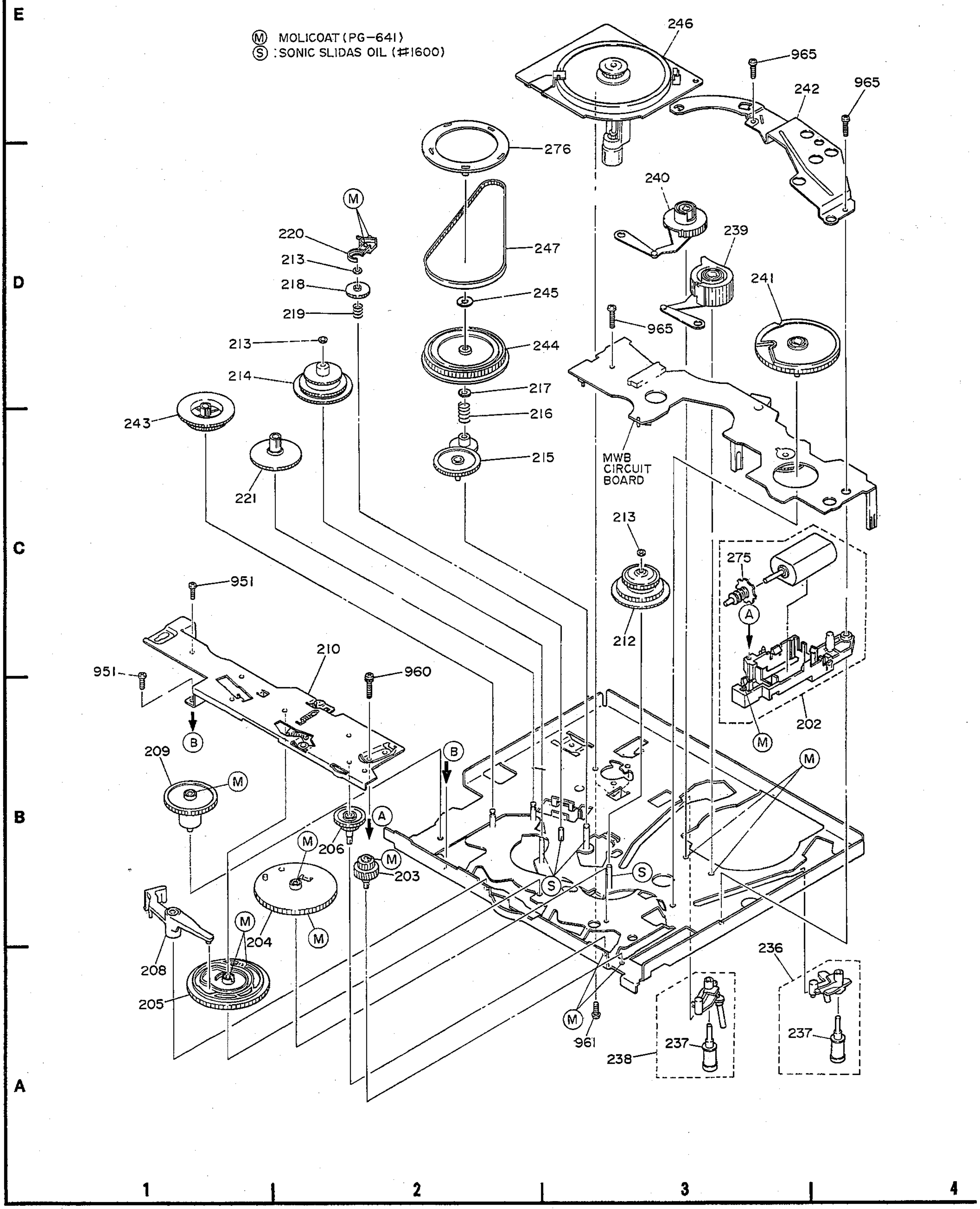
3. CHASSIS (TOP VIEW) SECTION



Ⓜ : MOLICOAT (PG-641)
Ⓢ : SONIC SLIDAS OIL (#1600)

E
D
C
B
A
1
2
3
4
952
267
991
501
502
962
961
262
955
260
264
952
261
954
263
270
958
268
280
Ⓜ
952
265
Ⓜ
956
253
252
951
951
957
957
255
254
250
223
Ⓢ
225
222
231
259
249
234
Ⓢ
224
248
257
225
233
258
251
Ⓜ
230
232
Ⓜ
Ⓢ
Ⓜ
228
227
226
Ⓜ
Ⓢ
Ⓜ
256
229
Ⓜ
Ⓜ
Ⓜ
271

4. CHASSIS (BOTTOM VIEW) SECTION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Ⓜ MOLICOAT (PG-641)
Ⓢ :SONIC SLIDAS OIL (#1600)
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MWB
CIRCUIT
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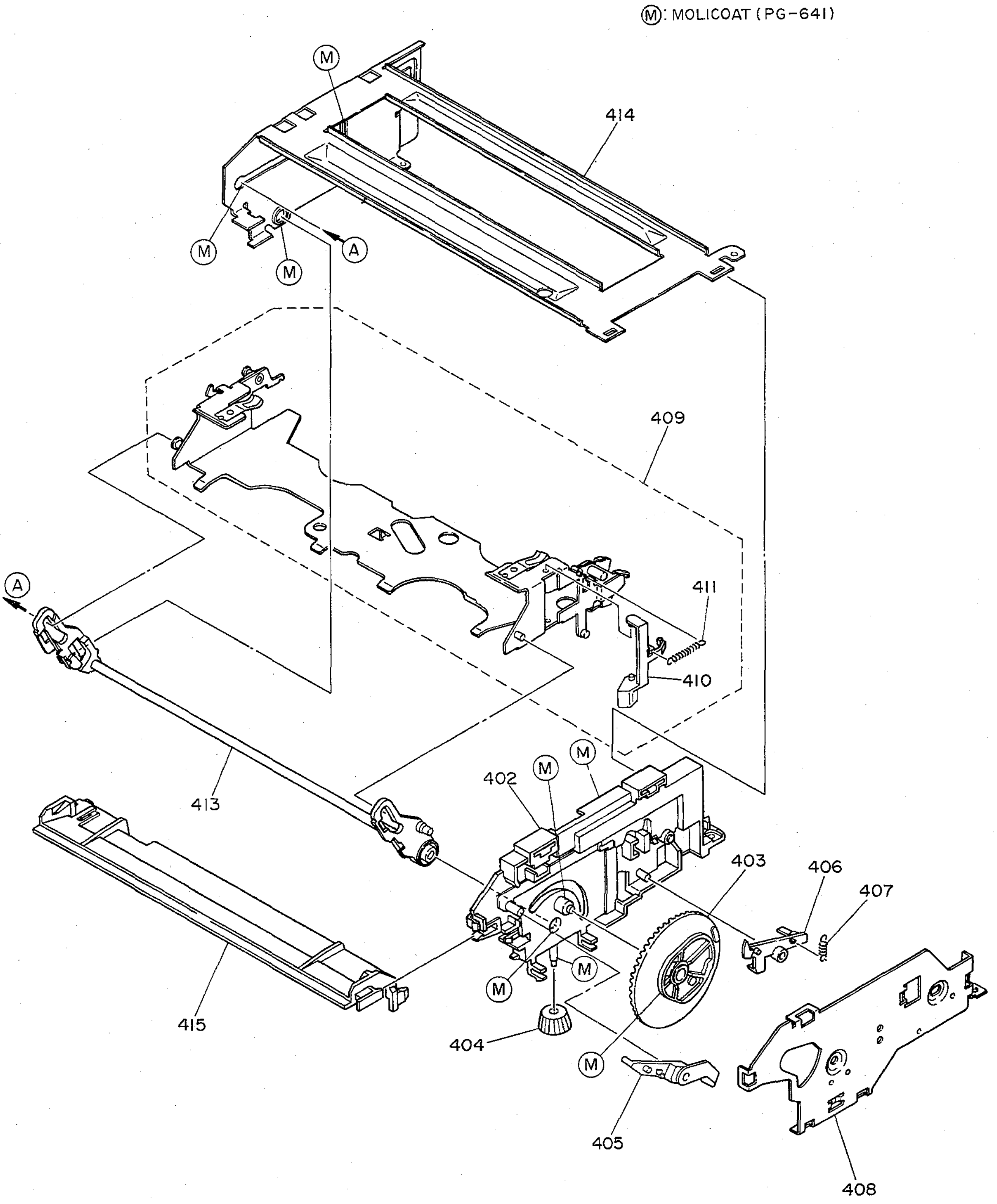
5. CASSETTE LOADING MECHANISM SECTION


Ⓜ: MOLICOAT (PG-641)
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MEMO

CHAPTER 6

REPLACEMENT PARTS LIST

1.MECHANICAL PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
101	0A10951	COVER, TOP
102	6008672	COVER, BOTTOM
104	PH14948	PANEL, FRONT
105	PH15241	DOOR, CONTROL
106	6811834	PIECE, REAR
108	7415793	BRACKET
109	4826831	SPRING
110	6529161	PLATE
113	4842811	PLATE
114	6812411	HOLDER
115	4330291	FELT
⚠116	5699151	AC INLET
119	5722411	HOLDER, FUSE
121	6898241	STUD
122	NA13861	PLATE, EARTH (R)
124	PC11412	KNOB, VOLUME
127	PH14825	PANEL, REAR
128	NA11361	BRACKET
143	6714211	NYLON RIVET - 3MMD
144	8815114	WASHER
202	6500761	MOTOR, LOADING
203	6441371	GEAR
204	6441392	GEAR
205	6406341	GEAR
206	6441381	GEAR
208	6823171	ARM, OPERATION
209	6441421	GEAR
210	6500321	PLATE
212	KF10271	GEAR, TAKE-UP
213	7788347	WASHER
214	6406291	GEAR (R)
215	6401446	ARM, FR
216	6522979	SPRING
217	6500841	WASHER
218	6441434	GEAR, CHANGE
219	6522978	SPRING
220	6823183	ARM
221	6441411	GEAR
222	6823314	ARM
223	6416632	REEL, TABLE (S)
224	6404141	REEL, TABLE (T)
225	4583333	WASHER
226	4589851	ARM, BRAKE (R)
227	6823229	ARM, BRAKE (L)
228	6318613	SPRING
229	6823272	BRAKE
230	6823261	BRAKE
231	4588971	ARM
232	6823251	GEAR
233	6823293	BRAKE
234	6558455	SPRING
236	6638943	BASE, GUIDE ROLLER (I)
237	KX12921	
238	6638957	BASE, GUIDE ROLLER (0)
239	4587681	GEAR, LOADING (L)
240	4587671	GEAR, LOADING (R)
241	6823538	GEAR, MODE
242	KX10181	BRACKET
243	6823542	GEAR
244	6406332	PULLY, TAKE UP
245	6500841	WASHER
246	GP10205	MOTOR, CAPSTAN
247	6358101	BELT
248	6823424	ARM
249	6553361	SPRING
250	6823437	ARM, OPERATION
251	6553301	SPRING
252	6823475	BAND, TENSION
253	6823511	SHAFT
254	4587661	ARM
255	6553352	SPRING
256	6638936	ARM
257	6823521	GEAR, CAM
258	6823445	BRACKET
259	6500434	ROLLER, PRESSURE
260	5434153	HEAD
261	6500593	BASE, AC H6AD
262	6554301	SPRING
263	6553151	SPRING
264	7785673	NUT
265	6638895	BASE, CYLINDER
267	FU10191	BRUSH, CYLINDER
268	5423081	HEAD, FULL ERASE
270	NA10564	HEAD CLEANING ASSY
271	6558502	SPRING
275	6816211	WORM
276	6358591	CAP
280	6823452	ROLLER
402	6823613	BRACKET
403	6823621	GEAR
404	6823631	GEAR
405	6823642	ARM
406	6823652	ARM
407	6558531	SPRING
408	6500612	BRACKET
409	6500623	HOLDER
410	6823691	ARM
411	6558541	SPRING
413	6823665	ARM
414	6500672	BRACKET
415	6823701	HOLDER
501	5436758	CYLINDER, UPPER (CY-G4P0)
502	5436782	CYLINDER, LOWER (CY-G4PK)
902	8699408	SCREW
904	7781138	SCREW (3X10BT)
905	8671305	SCREW (2.6X5)
906	8699412	SCREW (3X12) BLACK
908	0711312	PAN HEAD SCREW - 2.6MMD X 12MM
910	7785351	SCREW (4XL4)
911	8691408	SXCREW (3X8)
912	8699410	SCREW (3X10)
913	8678410	DT BIND SCREW-3MMDX10MM
914	8698410	BT BIND SCREW-3MMDX10MM
915	8639408	SCREW (3X8)
951	0711304	SCREW (2.6X4)
952	0711312	PAN HEAD SCREW - 2.6MMD X 12MM
954	0711306	PAN HEAD SCREW-2.6MMDX6MM
955	7773741	SCREW
956	4528181	SCREW
957	8650408	SCREW
958	0671308	DT SCREW-2.6MMDX8MM
960	8650914	SCREW (2.6X14S)
961	8741306	SCREW (2.6X6)
962	8741312	SPRING
965	MJ10251	SCREW (M2.6)
991	7784131	SCREW (3X8)

2.ELECTRICAL PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C0001	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0002	0209847	CERAMIC CHIP 82PF+-10% 50V
C0003	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0004	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0005	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0006	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0007	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0008	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0009	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0010	0209847	CERAMIC CHIP 82PF+-10% 50V
C0011	0893058	CERAMIC CHIP 0.33UF+80-20% 16V
C0012	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C0013	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C0014	0800186	ELECTROLYTIC 47UF 16V
C0015	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0016	0209891	CERAMIC CHIP 12PF+-5% 50V
C0017	0800186	ELECTROLYTIC 47UF 16V
C0018	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0019	0209849	CERAMIC CHIP 390PF+-5% 50V
C0020	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0021	0800186	ELECTROLYTIC 47UF 16V
C0022	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0023	0800186	ELECTROLYTIC 47UF 16V
C201	0209895	CERAMIC CHIP 39PF+-5% 50V
C202	0800122	ELECTROLYTIC 10UF 16V
C203	0207458	ELECTROLYTIC 10UF 25V
C204	0800122	ELECTROLYTIC 10UF 16V
C205	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C206	0800047	ELECTROLYTIC 100UF 6.3V
C207	0207458	ELECTROLYTIC 10UF 25V
C208	0209880	CERAMIC CHIP 10PF+-0.5% 50V
C209	0209894	CERAMIC CHIP 27PF+-10% 50V
C210	0893032	CERAMIC CHIP 1200PF+-10% 50V
C211	0209895	CERAMIC CHIP 39PF+-5% 50V
C212	0209872	CERAMIC DISC 2PF+-0.25% 50V
C213	0207458	ELECTROLYTIC 10UF 25V
C214	0800122	ELECTROLYTIC 10UF 16V
C215	0209896	CERAMIC CHIP 47PF+-5% 50V
C216	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C217	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C218	0800138	ELECTROLYTIC 47UF 6.3V
C219	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C220	0800138	ELECTROLYTIC 47UF 6.3V
C221	0800122	ELECTROLYTIC 10UF 16V
C223	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C224	0209893	CERAMIC CHIP 22PF+-10% 50V
C225	0209897	CERAMIC CHIP 56PF+-5% 50V
C226	0209848	CERAMIC DISC 150PF+-5% 50V
C227	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C229	0800138	ELECTROLYTIC 47UF 6.3V
C230	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C231	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C232	0800138	ELECTROLYTIC 47UF 6.3V
C233	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C234	0209894	CERAMIC CHIP 27PF+-10% 50V
C235	0209898	CERAMIC CHIP 100PF+-5% 50V
C236	0209853	CERAMIC DISC 68PF+-5% 50V
C237	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C238	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C239	0209894	CERAMIC CHIP 27PF+-10% 50V
C240	0207456	ELECTROLYTIC 1UF 50V
C241	0800117	ELECTROLYTIC 4.7UF 25V
C242	0800122	ELECTROLYTIC 10UF 16V
C244	0209893	CERAMIC CHIP 22PF+-10% 50V
C245	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C246	0800057	ELECTROLYTIC 220UF 10V
C248	0209903	CERAMIC CHIP 470PF+-5% 50V
C250	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C251	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C271	0209935	CERAMIC CHIP 27PF+-5% 50V
C290	0209933	CERAMIC CHIP 18PF+-5% 50V
C301	0800112	ELECTROLYTIC 2.2UF 50V
C302	0800112	ELECTROLYTIC 2.2UF 50V
C303	0800117	ELECTROLYTIC 4.7UF 25V
C304	0800109	ELECTROLYTIC 1.0UF 50V
C305	0209932	CERAMIC CHIP 15PF+-5% 50V
C306	0209921	CERAMIC CHIP 1PF+-0.25% 50V
C307	0893031	CERAMIC CHIP 1000PF+-10% 50V
C308	0800072	ELECTROLYTIC 470UF 6.3V
C309	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C310	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C311	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C312	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C313	0800138	ELECTROLYTIC 47UF 6.3V
C314	0209847	CERAMIC CHIP 82PF+-10% 50V
C315	0209906	CERAMIC DISC 820PF+-5% 50V
C316	0800105	ELECTROLYTIC 0.33UF 50V
C317	0880017	POLYESTER FILM 0.15UF+-10% 50V
C318	0209903	CERAMIC CHIP 470PF+-5% 50V
C319	0880017	POLYESTER FILM 0.15UF+-10% 50V
C320	0209847	CERAMIC CHIP 82PF+-10% 50V
C321	0800072	ELECTROLYTIC 470UF 6.3V
C322	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C323	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C324	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C325	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C326	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C327	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C328	0209898	CERAMIC CHIP 100PF+-5% 50V
C329	0880012	POLYESTER FILM 0.022UF+-10% 50V
C330	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C331	0209900	CERAMIC CHIP 270PF+-5% 50V
C332	0880012	POLYESTER FILM 0.022UF+-10% 50V
C333	0209903	CERAMIC CHIP 470PF+-5% 50V
C334	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C335	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C336	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C337	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C338	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C339	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C340	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C341	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C342	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C344	0209848	CERAMIC DISC 150PF+-5% 50V
C345	0209851	CERAMIC DISC 15PF+-5% 50V
C346	0880015	POLYESTER FILM 0.068UF+-10% 50V
C347	0800117	ELECTROLYTIC 4.7UF 25V
C348	0800122	ELECTROLYTIC 10UF 16V
C349	0800101	ELECTROLYTIC 0.1UF 50V
C351	0209794	CERAMIC CHIP 27PF+-5% 50V
C374	0890103	CERAMIC DISC 47000PF+80-20% 12V
C375	0890103	CERAMIC DISC 47000PF+80-20% 12V
C1101	0800373	ELECTROLYTIC 4700UF 6V
C1202	0890026	CERAMIC DISC 220PF+-10% 50V
C1206	0800039	ELECTROLYTIC 47UF 10V
C1207	0880009	POLYESTER FILM 0.01UF+-10% 50V
C1208	0890045	CERAMIC DISC 0.047UF+80-20% 50V

SYMBOL-NO	P-NO	DESCRIPTION
C1351	0209948	CERAMIC CHIP 330PF+-5% 50V
C1352	0800001	ELECTROLYTIC 0.47UF 50V
C1353	0800015	ELECTROLYTIC 10UF 16V
C1354	0800005	ELECTROLYTIC 2.2UF 50V
C1355	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1356	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1357	0800326	ELECTROLYTIC 100UF 16V
C1358	0800073	ELECTROLYTIC 470UF 10V
C1359	0893015	CERAMIC CHIP 0.012UF+-10% 25V
C1360	0800103	ELECTROLYTIC 0.22UF 50V
C1361	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1362	0800038	ELECTROLYTIC 47UF 6.3V
C1363	0209950	CERAMIC CHIP 470PF+-5% 50V
C1364	0800047	ELECTROLYTIC 100UF 6.3V
C1365	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1366	0209950	CERAMIC CHIP 470PF+-5% 50V
C1367	0800101	ELECTROLYTIC 0.1UF 50V
C1368	0207457	ELECTROLYTIC 4.7UF 50V
C1369	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1370	0800064	ELECTROLYTIC 330UF 6.3V
C1371	0800015	ELECTROLYTIC 10UF 16V
C1372	0800015	ELECTROLYTIC 10UF 16V
C1373	0207458	ELECTROLYTIC 10UF 25V
C1374	0800001	ELECTROLYTIC 0.47UF 50V
C1377	0209932	CERAMIC CHIP 15PF+-5% 50V
C1378	0209931	CERAMIC CHIP 12PF+-5% 50V
C1379	AJ10187R	CERAMIC CAPACITOR 27PF+-5% 50V
C1404	0880007	POLYESTER FILM 4700PF+-10% 50V
C1405	0800015	ELECTROLYTIC 10UF 16V
C1406	0800023	ELECTROLYITC 22UF 16V
C1408	0880016	POLYESTER FILM 0.1UF+-10% 50V
C1409	0880017	POLYESTER FILM 0.15UF+-10% 50V
C1410	0800015	ELECTROLYTIC 10UF 16V
C1411	0209942	CERAMIC CHIP 100PF+-5% 50V
C1412	0800109	ELECTROLYTIC 1.0UF 50V
C1413	0800109	ELECTROLYTIC 1.0UF 50V
C1414	0800003	ELECTROLYTIC 1UF 50V
C1415	0880011	POLYESTER FILM 0.015UF+-10% 50V
C1416	0800015	ELECTROLYTIC 10UF 16V
C1417	0800015	ELECTROLYTIC 10UF 16V
C1418	0880004	POLYESTER FILM 1500PF+-10% 50V
C1419	0800015	ELECTROLYTIC 10UF 16V
C1420	0800032	ELECTROLYTIC 33UF 16V
C1421	0893037	CERAMIC CHIP 3300PF+-10% 50V
C1422	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1423	0209946	CERAMIC CHIP 220PF+-5% 50V
C1424	0268449	MYLAR 0.047UF+-5% 100V
C1425	0800015	ELECTROLYTIC 10UF 16V
C1426	0202159	CERAMIC CHIP 680PF+-5% 50V
C1430	0880014	POLYESTER FILM 0.047UF+-10% 50V
C1431	0880198	CAPACITOR 0.22UF 50V
C1432	0880014	POLYESTER FILM 0.047UF+-10% 50V
C1433	0880009	POLYESTER FILM 0.01UF+-10% 50V
C1434	0800003	ELECTROLYTIC 1UF 50V
C1437	0880015	POLYESTER FILM 0.068UF+-10% 50V
C1439	0800009	ELECTROLYTIC 4.7UF 25V
C1440	0800015	ELECTROLYTIC 10UF 16V
C1441	0800049	ELECTROLYTIC 100UF 16V
C1442	0893063	CERAMIC CHIP 0.022UF+80-20% 25V
C1443	0800015	ELECTROLYTIC 10UF 16V
C1501	0209946	CERAMIC CHIP 220PF+-5% 50V
C1502	0209946	CERAMIC CHIP 220PF+-5% 50V
C1503	0209946	CERAMIC CHIP 220PF+-5% 50V
C1505	0209946	CERAMIC CHIP 220PF+-5% 50V
C1507	0209946	CERAMIC CHIP 220PF+-5% 50V
C1508	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1515	0893087	CERAMIC CHIP 0.15UF+80-20% 50V
C1516	0893087	CERAMIC CHIP 0.15UF+80-20% 50V
C1517	0893087	CERAMIC CHIP 0.15UF+80-20% 50V
C1518	0893087	CERAMIC CHIP 0.15UF+80-20% 50V
C1519	0893087	CERAMIC CHIP 0.15UF+80-20% 50V
C1520	0893087	CERAMIC CHIP 0.15UF+80-20% 50V
C1531	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1532	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1601	0880046	POLYESTER FILM 0.015UF+-10% 50V
C1602	0800005	ELECTROLYTIC 2.2UF 50V
C1603	0207444	ELECTROLYTIC 1.0UF 50V
C1604	0880051	MYLAR 0.033UF+-10% 50V
C1605	0207453	ELECTROLYTIC 2.2UF 50V
C1606	0800117	ELECTROLYTIC 4.7UF 25V
C1608	0800015	ELECTROLYTIC 10UF 16V
C1609	0880019	POLYESTER FILM 0.33UF+-10% 50V
C1610	0880033	MYLAR 1500PF+-10% 50V
C1611	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1612	0800022	ELECTROLYTIC 22UF 10V
C1613	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1614	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1618	0890038	CERAMIC DISC 3300PF+-20% 16V
C1619	0893027	CERAMIC CHIP 0.1UF+-10% 25V
C1620	0800032	ELECTROLYTIC 33UF 16V
C1622	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1623	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1624	0209944	CERAMIC CHIP 150PF+-5% 50V
C1625	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C1627	0209948	CERAMIC CHIP 330PF+-5% 50V
C1628	0209943	CERAMIC DISC 120PF+-5% 50V
C1629	0800015	ELECTROLYTIC 10UF 16V
C1630	0800015	ELECTROLYTIC 10UF 16V
C1631	0880055	MYLAR 0.068UF+-10% 50V
C1632	0202166	CERAMIC CHIP 820PF+-5% 50V
C1633	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1634	0800079	ELECTROLYTIC 1000UF 6.3V
C1635	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1642	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1643	0800126	ELECTROLYTIC 22UF 6.3V
C1644	0209893	CERAMIC CHIP 22PF+-10% 50V
C1645	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1649	0800117	ELECTROLYTIC 4.7UF 25V
C1650	0207444	ELECTROLYTIC 1.0UF 50V
C1651	0207452	ELECTROLYTIC 22UF 10V
C1652	0209948	CERAMIC CHIP 330PF+-5% 50V
C1653	0880012	POLYESTER FILM 0.022UF+-10% 50V
C1654	0880003	POLYESTER FILM 1000PF+-10% 50V
C1655	0800003	ELECTROLYTIC 1UF 50V
C1656	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1657	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1658	0800003	ELECTROLYTIC 1UF 50V
C1659	0880057	POLYESTER FILM 0.1UF+-10% 50V
C1661	0890013	CERAMIC DISC 22PF+-5% 50V
C1663	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C1703	0880012	POLYESTER FILM 0.022UF+-10% 50V
C1704	0800015	ELECTROLYTIC 10UF 16V
C1706	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1707	0800039	ELECTROLYTIC 47UF 10V
C1708	0209931	CERAMIC CHIP 12PF+-5% 50V
C1709	0209936	CERAMIC CHIP 33PF+-5% 50V
C1710	0800039	ELECTROLYTIC 47UF 10V
C1711	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1712	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1713	0893048	CERAMIC CHIP 0.022UF+-10% 50V

SYMBOL-NO	P-NO	DESCRIPTION
C1714	0800039	ELECTROLYTIC 47UF 10V
C1715	0893048	CERAMIC CHIP 0.022UF+-10% 50V
C1852	0800204	CERAMIC CHIP 100PF+-20% 25V
C1853	0800202	ELECTROLYTIC 10UF 25V
C1855	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C1856	AL10217F	ELECTROLYIC 1000UF 16V
C1857	0800203	ELECTROLYTIC 100UF 50V
C1858	0800204	CERAMIC CHIP 100PF+-20% 25V
C1859	0800204	CERAMIC CHIP 100PF+-20% 25V
C1867	0255786	ELECTROLYTIC 4700UF 35V
⚠C1891	AJ10294	CERAMIC CAPACITOR 4700PF+-20% 125V
C1902	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1903	0209942	CERAMIC CHIP 100PF+-5% 50V
C1905	0800003	ELECTROLYTIC 1UF 50V
C1906	0890035	CERAMIC DISC 1000PF+-10% 50V
C1907	0800032	ELECTROLYTIC 33UF 16V
C1909	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1910	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1911	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1913	0800033	ELECTROLYTIC 33UF 25V
C1914	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1916	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1917	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1918	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1919	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1921	0217841	CERAMIC CHIP 1.0UF+-20% 10V
C1922	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1923	0800039	ELECTROLYTIC 47UF 10V
C1927	0800072	ELECTROLYTIC 470UF 6.3V
C1928	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1954	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C2101	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2851	0880014	POLYESTER FILM 0.047UF+-10% 50V
C2852	0207714	ELECTROLYTIC 100UF 63V
C2853	0207713	ELECTROLYTIC 22UF 63V
C2854	0800195	CERAMIC CHIP 1.0PF+-20% 50V
C2855	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2856	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2857	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C2858	0800201	ELECTROLYTIC 33UF 16V
C2859	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C2860	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C2861	0800202	ELECTROLYTIC 10UF 25V
C2865	0890022	CERAMIC DISC 100PF+-10% 50V
C2870	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C2872	0890045	CERAMIC DISC 0.047UF+80-20% 50V
		RESISTORS
R0001	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0002	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R0003	0103824	CHIP RESISTOR 27 OHM+-5% 0.1W
R0004	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0005	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0006	0103824	CHIP RESISTOR 27 OHM+-5% 0.1W
R0007	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0008	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R0009	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0010	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0011	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R0012	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0013	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R0014	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0015	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0016	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0017	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0018	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0019	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R0022	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0023	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R201	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R202	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R203	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R204	0103836	CHIP RESISTOR 270 OHM+-5% 0.1W
R205	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R206	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R207	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R208	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R209	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R210	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R211	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R212	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R213	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R214	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R215	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R217	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R218	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R219	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R220	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R222	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R223	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R224	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R225	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R226	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R227	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R228	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R231	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R232	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R254	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R255	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R256	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R258	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R260	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R263	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R290	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R301	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R302	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R303	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R304	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R305	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R306	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R307	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R308	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R309	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R310	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R311	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R312	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R313	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R314	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R315	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R316	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R317	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R318	0103836	CHIP RESISTOR 270 OHM+-5% 0.1W
R319	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R320	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R321	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R322	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R323	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R324	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R325	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R326	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R327	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R328	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R329	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R330	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R331	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R332	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R333	0101764	RESISTOR 5.6KOHM+-1%1/8W
R334	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R335	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R336	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R337	0101734	METAL FILM 33KOHM 1/8W
R338	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R339	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R340	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R341	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R342	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R343	0101771	CHIP RESISTOR 39KOHM+-1% 1/8W
R344	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R346	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
⚠R1131	0101718	RESISTOR 75 OHM+-5% 1/6W
R1201	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1202	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1203	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1204	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1206	0700064	CARBON FILM 56KOHM+-5% 1/8W
R1207	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1208	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1209	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1210	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1211	0101821	CARBON FILM 100 OHM+-5% 1/4W
R1212	0101821	CARBON FILM 100 OHM+-5% 1/4W
R1215	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1221	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1222	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1223	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1224	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1225	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1226	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1227	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1228	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1229	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1230	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1231	0700056	CARBON FILM 15KOHM+-5% 1/8W
R1232	0700068	CARBON FILM 120KOHM+-5% 1/8W
R1233	0700062	CARBON FILM 39KOHM+-5% 1/8W
R1234	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1235	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1236	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1237	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1238	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1239	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1240	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1241	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1242	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1243	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1244	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1245	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1246	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1247	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1248	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1249	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1250	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1301	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1302	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1303	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1304	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1305	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1306	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1307	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1308	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1309	0700044	CARBON FILM 1.8KOHM+-5% 1/8W
R1310	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1311	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1312	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1313	0700048	CARBON FILM 3.9KOHM+-5% 1/8W
R1314	0700027	CARBON FILM 100 OHM+-5% 1/8W
R1315	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R1316	0700074	CARBON FILM 330KOHM+-5% 1/8W
R1317	0700051	CARBON FILM 5.6KOHM+-5% 1/8W
R1318	0700047	CARBON FILM 3.3KOHM+-5% 1/8W
R1351	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1352	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1353	0103829	CHIP RESISTOR 68 OHM+-5% 0.1W
R1354	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R1355	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1356	0104114	CHIP RESISTOR 3.3KOHM+-1% 0.1W
R1357	0104111	CHIP RESISTOR 10KOHM+-1% 1/10W
R1358	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1359	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1360	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R1361	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R1362	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R1363	0103878	CHIP RESISTOR 820KOHM+-5% 0.1W
R1364	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1365	0104111	CHIP RESISTOR 10KOHM+-1% 1/10W
R1366	0104278	CARBON FILM 120KOHM+-1% 1/10W
R1367	0104261	METAL FILM 2KOHM+-1% 1/10W
R1368	0104274	CHIP RESISTOR 1.5KOHM+-1% 1/10W
R1369	0104261	METAL FILM 2KOHM+-1% 1/10W
R1370	0104274	CHIP RESISTOR 1.5KOHM+-1% 1/10W
R1371	0101761	CHIP RESISTOR 2.7KOHM+-1% 1/8W
R1372	0105572	METAL FILM RESISTOR 2.7KOHM+-1% 1/10
R1373	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1375	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1376	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1377	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1379	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1380	0103881	CHIP RESISTOR 2.2MOHM+-10% 0.1W
R1381	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1382	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1402	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1403	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1405	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R1406	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R1407	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R1408	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1409	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1410	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1411	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1413	0103819	CHIP RESISTOR 10 OHM+-5% 0.1W
R1414	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R1415	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1416	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1417	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1418	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1419	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1420	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1422	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R1423	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R1424	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1425	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R1426	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1427	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1428	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1429	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1430	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1431	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R1432	0101725	CHIP RESISTOR 2.2 OHM+-5% 1/4W
R1433	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1434	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R1435	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1436	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1439	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1441	0700059	CARBON FILM 27KOHM+-5% 1/8W
R1443	0700061	CARBON FILM 33KOHM+-5% 1/8W
R1444	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1445	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1446	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1447	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1505	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1506	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1507	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1508	0111276	METAL FILM 100 OHM+-5% 2W
R1512	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1513	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1514	0111276	METAL FILM 100 OHM+-5% 2W
R1517	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1521	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1522	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1523	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1525	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1527	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1528	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1529	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1531	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1545	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1546	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1548	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1601	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1602	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1603	0103872	CHIP RESISTOR 270KOHM+-5% 0.1W
R1604	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1605	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1606	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1607	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1608	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1609	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1610	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1611	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1612	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1613	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R1614	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1615	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R1616	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1617	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1618	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1619	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1620	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1622	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1623	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1624	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1625	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1626	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1627	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1630	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1632	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1635	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1636	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1637	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1638	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1639	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R1640	0103880	CHIP RESISTOR 1.5MOHM+-10% 0.1W
R1641	0103878	CHIP RESISTOR 820KOHM+-5% 0.1W
R1642	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1643	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R1644	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1645	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1646	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1647	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1648	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1649	0700051	CARBON FILM 5.6KOHM+-5% 1/8W
R1651	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R1652	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R1654	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1663	0103881	CHIP RESISTOR 2.2MOHM+-10% 0.1W
R1664	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1665	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1666	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1668	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1669	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1670	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1671	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1672	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1673	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1674	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R1675	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1676	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1677	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1678	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R1679	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R1680	0103866	CHIP RESISTOR 82KOHM+-5% 0.1W
R1681	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1682	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1683	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1684	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1685	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1686	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1688	AQ10217R	CHIP RESISTOR 390KOHM+-1% 1/10W
R1690	0105561	CHIP RESISTOR 200KOHM+-1% 1/10W
R1696	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1697	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1699	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1701	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R1705	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1706	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1707	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1708	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1709	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1710	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1711	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1712	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1713	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1714	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1715	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1719	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1720	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1722	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1723	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1724	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R1726	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1728	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1729	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1730	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1732	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1733	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1734	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1735	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1736	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1737	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1738	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1739	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1740	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1741	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1742	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1743	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1744	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1749	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1750	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1754	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1755	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1758	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1763	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1765	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R1770	0103881	CHIP RESISTOR 2.2MOHM+-10% 0.1W
R1771	0103872	CHIP RESISTOR 270KOHM+-5% 0.1W
R1772	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R1773	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R1780	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1781	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1782	0700058	CARBON FILM 22KOHM+-5% 1/8W
R1783	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1786	0700058	CARBON FILM 22KOHM+-5% 1/8W
R1788	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1789	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1790	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R1796	0103875	CHIP RESISTOR 470KOHM+-5% 0.1W
R1851	0101844	CARBON FILM 8.2KOHM+-5% 1/4W
⚠R1871	0101712	FUSE RESISTOR 6.8 OHM+-5% 1/4W
R1884	0700036	CARBON FILM 470 OHM+-5% 1/8W
R1901	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1902	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1904	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1905	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1906	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R1909	0700058	CARBON FILM 22KOHM+-5% 1/8W
R1910	0700066	CARBON FILM 82KOHM+-5% 1/8W
R1911	0700047	CARBON FILM 3.3KOHM+-5% 1/8W
R1912	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R1913	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1914	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1915	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1916	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1917	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1918	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1920	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1921	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1922	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1923	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1924	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1925	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1926	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1928	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1934	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R1935	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R1936	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1937	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1938	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1940	0700034	CARBON FILM 330 OHM+-5% 1/8W
R1941	0700031	CARBON FILM 180 OHM+-5% 1/8W
R1942	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1943	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1944	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1945	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1946	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1947	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1948	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1949	0700034	CARBON FILM 330 OHM+-5% 1/8W
R1950	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1953	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R1954	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1955	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1956	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1957	0103935	CHIP RESISTOR 1KOHM+-5%
R1958	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1959	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1960	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1961	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R1962	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1963	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1964	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R1966	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1969	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1970	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1975	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1978	0700043	CARBON FILM 1.5KOHM+-5% 1/8W
R1979	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1980	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1988	0700054	CARBON FILM 10KOHM+-5% 1/8W
⚠R1990	0101711	FUSE RESISTOR 2.2OHM+-5% 1/4W
R1993	0103872	CHIP RESISTOR 270KOHM+-5% 0.1W
R1994	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1995	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1996	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1997	0103872	CHIP RESISTOR 270KOHM+-5% 0.1W
R1998	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1999	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R2851	0700074	CARBON FILM 330KOHM+-5% 1/8W
R2852	0700057	CARBON FILM 18KOHM+-5% 1/8W
R2859	0101756	CHIP RESISTOR 1KOHM+-1% 1/8W
R2860	1109024	METAL FILM 294 OHM+-1% 1/8W
R2868	0700046	CARBON FILM 2.7KOHM+-5% 1/8W
R2869	0101944	CARBON FILM 8.2KOHM+-5% 1/4W
R2870	0101944	CARBON FILM 8.2KOHM+-5% 1/4W
RT201	5006234	SEMI VARIABLE 1KOHM
RT301	5006236	SEMI VARIABLE 4.7KOHM
RT302	AW10138	SEMI VARIABLE RESISTOR 22KOHM
RT303	5006236	SEMI VARIABLE 4.7KOHM
RT304	5006238	SEMI VARIABLE 22KOHM
RT1301	5002082	VARIABLE 10KOHM
RT1302	5002082	VARIABLE 10KOHM
RT1303	5009136	VARIABLE RESISTOR
RT1304	5009136	VARIABLE RESISTOR
RT1351	AW10208R	SEMI VARIABLE 22KOHM+-25% 0.3W
RT1401	AW10209R	SEMI VARIABLE 47KOHM
RT1402	AW10207R	SEMI VARIABLE 10KOHM
RT1601	AW10212R	SEMI VARIABLE 220KOHM

SEMI-CONDUCTORS

SYMBOL-NO	P-NO	DESCRIPTION
D0001	5328301	DIODE MA151WK (MT)
D0002	5328301	DIODE MA151WK (MT)
D0004	5328301	DIODE MA151WK (MT)
D0005	5339131	DIODE 1SS254
D201	5339131	DIODE 1SS254
D202	5339131	DIODE 1SS254
D301	5339131	DIODE 1SS254
D1201	5339551	DIODE SS1J4
D1301	5339131	DIODE 1SS254
D1351	5339131	DIODE 1SS254
D1401	5339131	DIODE 1SS254
D1403	5339131	DIODE 1SS254
D1405	5328301	DIODE MA151WK (MT)
D1406	5339131	DIODE 1SS254
D1407	5339131	DIODE 1SS254
D1410	5339131	DIODE 1SS254
D1411	5339131	DIODE 1SS254
D1412	5339131	DIODE 1SS254
D1501	5339231	DIODE 1SR35-100A
D1502	5339231	DIODE 1SR35-100A
D1503	1330011	DIODE DINS4
D1601	5339131	DIODE 1SS254
D1604	5339131	DIODE 1SS254
D1605	5339131	DIODE 1SS254
D1607	5339231	DIODE 1SR35-100A
D1608	5339231	DIODE 1SR35-100A
D1609	5339131	DIODE 1SS254
D1612	5328301	DIODE MA151WK (MT)
D1614	5328301	DIODE MA151WK (MT)
D1619	1330011	DIODE DINS4
D1701	5339551	DIODE SS1J4
D1702	5339551	DIODE SS1J4
D1704	5339551	DIODE SS1J4
D1707	5339131	DIODE 1SS254
⚠D1851	5333351	DIODE D3SBA20
⚠D1852	5336371	DIODE RBA406B
D1856	5339231	DIODE 1SR35-100A
D1857	5339231	DIODE 1SR35-100A
D1901	5339551	DIODE SS1J4
D1918	5339131	DIODE 1SS254
D2101	5380933	LED GL451
D2851	5339171	DIODE 1SS130M
D2852	5339171	DIODE 1SS130M
D2853	5339171	DIODE 1SS130M
D2854	5339171	DIODE 1SS130M
IC0001	1362321	IC HA118162NT
IC201	1373542	IC HT7284A
IC202	5362263	IC MSM6965RS
IC206	1340041	IC HA118070
IC301	1351511	IC M52057FP
IC302	1373682	IC HT7323A
IC1201	1349041	IC UPD16312GB-3B4
IC1351	1362401	IC M52096SP
IC1352	1361448	IC UPD6450C-536
IC1353	1361932	IC BA7046A
IC1401	1347091	IC XRA7795LS
IC1402	5300641	IC BA7755
IC1601	CP10501	IC HD49791NT
IC1602	5350601	IC NJM4558D
IC1605	1361821	IC BA860
IC1606	5350601	IC NJM4558D
IC1607	5359901	IC UPD4066C
IC1608	5359901	IC UPD4066C
IC1609	1350792	IC TC4S66F
IC1612	1350792	IC TC4S66F
IC1613	1350792	IC TC4S66F
IC1701	CP11905	IC SC78014-Y44
IC1702	CP10242	IC S-29255ADPG
IC1706	5361942	IC S-8053ALB
IC1901	CK15166	IC UPD75517GF-415
IC1902	5300795	IC XRA6209U4
IC1903	1340112	IC PST520C
IC1905	5364594	IC NJM2903D
IC2101	5327521	PHOTO TRANSISTOR SPI-315-C
IC2102	5327521	PHOTO TRANSISTOR SPI-315-C
IC2851	1361882	IC PQ30RV21
IC2852	1341956	IC M5278D09
Q0001	5328793	TRANSISTOR DTC144EK
Q0002	5328972	TRANSISTOR 2SC2412K-BRT
Q0003	5328972	TRANSISTOR 2SC2412K-BRT
Q0004	5328972	TRANSISTOR 2SC2412K-BRT
Q0005	5328793	TRANSISTOR DTC144EK
Q211	5328971	TRANSISTOR 2SC2412KBRST
Q212	5328971	TRANSISTOR 2SC2412KBRST
Q213	5328971	TRANSISTOR 2SC2412KBRST
Q214	5328971	TRANSISTOR 2SC2412KBRST
Q216	5328971	TRANSISTOR 2SC2412KBRST
Q217	5328971	TRANSISTOR 2SC2412KBRST
Q301	5328961	TRANSISTOR 2SA1037KERS
Q302	5328961	TRANSISTOR 2SA1037KERS
Q303	5328971	TRANSISTOR 2SC2412KBRST
Q311	5328971	TRANSISTOR 2SC2412KBRST
Q312	5328971	TRANSISTOR 2SC2412KBRST
Q314	5328971	TRANSISTOR 2SC2412KBRST
Q1351	5328961	TRANSISTOR 2SA1037KERS
Q1352	5328961	TRANSISTOR 2SA1037KERS
Q1353	5328972	TRANSISTOR 2SC2412K-BRT
Q1354	5328961	TRANSISTOR 2SA1037KERS
Q1355	5328793	TRANSISTOR DTC144EK
Q1356	5328793	TRANSISTOR DTC144EK
Q1357	5328793	TRANSISTOR DTC144EK
Q1403	5328793	TRANSISTOR DTC144EK
Q1407	5328793	TRANSISTOR DTC144EK
Q1408	5328793	TRANSISTOR DTC144EK
Q1411	1320004	TRANSISTOR 2SA854SQR
Q1412	5328972	TRANSISTOR 2SC2412K-BRT
Q1413	5323172	TRANSISTOR 2SC1214CD
Q1414	5328972	TRANSISTOR 2SC2412K-BRT
Q1415	5328793	TRANSISTOR DTC144EK
Q1416	5328793	TRANSISTOR DTC144EK
Q1417	5328793	TRANSISTOR DTC144EK
Q1418	5328793	TRANSISTOR DTC144EK
Q1419	5328795	TRANSISTOR DTA144EK-16
Q1420	5328793	TRANSISTOR DTC144EK
Q1421	5328793	TRANSISTOR DTC144EK
Q1422	5328791	TRANSISTOR DTC124K (25)
Q1424	5328793	TRANSISTOR DTC144EK
Q1425	5328793	TRANSISTOR DTC144EK
Q1504	5328793	TRANSISTOR DTC144EK
Q1505	5328793	TRANSISTOR DTC144EK
Q1506	5327031	TRANSISTOR 2SA673 (C)
Q1510	5328793	TRANSISTOR DTC144EK
Q1511	5327031	TRANSISTOR 2SA673 (C)
Q1514	5328793	TRANSISTOR DTC144EK
Q1518	5328793	TRANSISTOR DTC144EK
Q1519	5328793	TRANSISTOR DTC144EK
Q1603	5328972	TRANSISTOR 2SC2412K-BRT
Q1604	5328972	TRANSISTOR 2SC2412K-BRT
Q1605	5328972	TRANSISTOR 2SC2412K-BRT
Q1607	5328793	TRANSISTOR DTC144EK

SYMBOL-NO	P-NO	DESCRIPTION
Q1609	5328793	TRANSISTOR DTC144EK
Q1611	5328793	TRANSISTOR DTC144EK
Q1618	5328793	TRANSISTOR DTC144EK
Q1619	5328793	TRANSISTOR DTC144EK
Q1623	5328793	TRANSISTOR DTC144EK
Q1624	5328793	TRANSISTOR DTC144EK
Q1626	5328793	TRANSISTOR DTC144EK
Q1637	5328793	TRANSISTOR DTC144EK
Q1702	5328972	TRANSISTOR 2SC2412K-BRT
Q1851	CF10311	TRANSISTOR 2SD2398
Q1901	5328961	TRANSISTOR 2SA1037KERS
Q1902	5328961	TRANSISTOR 2SA1037KERS
Q1903	5328793	TRANSISTOR DTC144EK
Q1904	5328972	TRANSISTOR 2SC2412K-BRT
Q1905	5328793	TRANSISTOR DTC144EK
Q1906	5328795	TRANSISTOR DTA144EK-16
Q1913	5328792	TRANSISTOR DTA124K (15)
Q1914	5328793	TRANSISTOR DTC144EK
Q1919	5328793	TRANSISTOR DTC144EK
Q1923	5327261	TRANSISTOR 2SB1326 (Q)
Q1924	5328791	TRANSISTOR DTC124K (25)
Q1925	5328793	TRANSISTOR DTC144EK
Q1931	5328793	TRANSISTOR DTC144EK
Q2101	5324661	PHOTO TRANSISTOR PT-483F1H
Q2102	5324661	PHOTO TRANSISTOR PT-483F1H
Q2851	5327031	TRANSISTOR 2SA673 (C)
Q2863	CF10311	TRANSISTOR 2SD2398
⚠ QF1201	5721941	IC PROTECTOR
⚠ QF1901	5721941	IC PROTECTOR
QR202	5328793	TRANSISTOR DTC144EK
QR206	5328793	TRANSISTOR DTC144EK
QR207	5328793	TRANSISTOR DTC144EK
QR209	5328793	TRANSISTOR DTC144EK
QR305	5328793	TRANSISTOR DTC144EK
QR306	5328791	TRANSISTOR DTC124K (25)
QR307	5328793	TRANSISTOR DTC144EK
QR309	5328793	TRANSISTOR DTC144EK
ZD1202	5339262	DIODE HZS6-C2
ZD1351	5339272	DIODE HZS6-A3
ZD1352	5339272	DIODE HZS6-A3
ZD1353	5339272	DIODE HZS6-A3
ZD1354	5339272	DIODE HZS6-A3
ZD1601	5339282	DIODE HZS6-B2
ZD1602	5339296	DIODE HZS5B2
ZD1701	5339262	DIODE HZS6-C2
ZD1851	5339482	DIODE HZS15-2
ZD1901	5339478	DIODE HZS11C3
ZD1903	5339282	DIODE HZS6-B2
ZD2851	5339254	DIODE HZS30-1
ZD2858	5339274	DIODE HZS15-3
		TRANSFORMERS
⚠ T852	5214535	TRANSFORMER, POWER
T1401	5261533	TRANSFORMER
		COILS
L0001	5159154	CHOKE COIL 100UH
L0002	5159154	CHOKE COIL 100UH
L0003	0770057	CHOKE COIL 100UH+-5%
L0004	0770057	CHOKE COIL 100UH+-5%
L0005	0770057	CHOKE COIL 100UH+-5%
L0006	0770057	CHOKE COIL 100UH+-5%
L0007	5159146	CHOKE COIL 27UH

SYMBOL-NO	P-NO	DESCRIPTION
L201	5159149	CHOKE COIL 47UH
L202	5159086	CHOKE COIL
L203	5159145	CHOKE COIL 22UH
L204	5159151	CHOKE COIL 56UH
L205	5159144	CHOKE COIL 18UH
L207	5159147	CHOKE COIL 33UH
L208	0770057	CHOKE COIL 100UH+-5%
L209	0770057	CHOKE COIL 100UH+-5%
L210	5159146	CHOKE COIL 27UH
L212	0770057	CHOKE COIL 100UH+-5%
L214	0770057	CHOKE COIL 100UH+-5%
L215	5159141	CHOKE COIL 10UH
L216	0770057	CHOKE COIL 100UH+-5%
L218	0770057	CHOKE COIL 100UH+-5%
L290	5159148	CHOKE COIL 39UH
L301	5159149	CHOKE COIL 47UH
L302	0770057	CHOKE COIL 100UH+-5%
L304	5159148	CHOKE COIL 39UH
L305	5159154	CHOKE COIL 100UH
L306	5159143	COIL 15UH
L307	0770068	CHOKE COIL 680UH+-5%
L308	0770064	CHOKE COIL 330UH+-5%
L309	0770064	CHOKE COIL 330UH+-5%
L310	0770057	CHOKE COIL 100UH+-5%
L311	5159145	CHOKE COIL 22UH
L312	5159149	CHOKE COIL 47UH
L313	5159153	CHOKE COIL 82UH
L1351	0770062	CHOKE COIL 220UH+-5%
L1352	0770057	CHOKE COIL 100UH+-5%
L1353	0770057	CHOKE COIL 100UH+-5%
L1354	0770057	CHOKE COIL 100UH+-5%
L1355	0770052	COIL, CHOKE 39UH+-5%
L1401	0770057	CHOKE COIL 100UH+-5%
L1402	BH10201	COIL 33MH
L1601	0770057	CHOKE COIL 100UH+-5%
L1602	0770057	CHOKE COIL 100UH+-5%
⚠ L1851	5220381	FILTER
⚠ L1852	5220381	FILTER
		CRYSTALS
X201	5778182	CRYSTAL
X301	5784552	CRYSTAL
X1301	5778462	CRYSTAL
X1701	BP10251	CRYSTAL
X1702	BP10421R	CRYSTAL
X1901	5779191	CRYSTAL
		MISCELLANEOUS
BA1101	FS10283	BATTERY
CN0001	5813916	MINI CONNECTOR
CN0002	5846303	CONNECTOR
CN0003	5846952	CONNECTOR
CN0004	5842522	CONNECTOR
CN0005	5846274	CONNECTOR
CN0006	5813733	MINI CONNECTOR
CN0007	5813767	CONNECTOR
CN0009	5846206	CONNECTOR
CN0010	EF10367	CONNECTOR
CN0015	1880362	CONNECTOR
SP201	5165331	FILTER, LOW PASS
CP202	5163533	FILTER
CP203	5163805	FILTER, LOW PASS
CP204	5165212	FILTER, LOW PASS

SYMBOL-NO	P-NO	DESCRIPTION
CP205	5162391	HIGH PASS FILTER
CP301	5163792	LC FILTER
CP302	5165051	FILTER
CP303	5785388	DELAY LINE
CP1351	5163372	FILTER
DG1201	DD10131	DISPLAY, FLOURESCENT
⚠FU851	5721061	FUSE 1.6A
⚠FU852	5720177	FUSE 2A
⚠FU853	5720174	FUSE 630MA
PG0001	5655102	CONNECTOR
PG0002	5666569	MINI PLUG
PG0003	5666149	MINI PLUG
PG206	5668164	SOCKET
PG207	5668165	MINI PLUG
PG208	5668167	MINI PLUG
PG1103	5668178	MINI PLUG
PG1104	5668178	MINI PLUG
PG1121	5666578	PLUG
PG1122	5666591	MINI PLUG
PG1131	5655042	PLUG
PG1132	5655042	PLUG
PG1135	ED10691	PLUG
PG1200	5666563	MINI PLUG
PG1201	5665631	MINI PLUG
PG1202	5665631	MINI PLUG
PG1203	5669595	CONNECTOR
PG1303	5668168	MINI PLUG
PG1401	5666609	MINI PLUG
PG1502	5666569	MINI PLUG
PG1503	5666149	MINI PLUG
PG1521	5668184	MINI PLUG
PG1522	5668185	MINI PLUG
PG1524	5668187	MINI PLUG
PG1562	5666575	MINI PLUG
PG1581	5666145	MINI CONNECTOR
PG1582	5666151	MINI PLUG
PG1603	5666562	MINI PLUG
PG1608	5666567	MINI PLUG
PG1609	5666566	PLUG
PG1701	5665641	MINI PLUG
PG1702	5665641	MINI PLUG
PG1703	5668198	PLUG
PG1704	5668198	PLUG
PG1901	5662855	PLUG
PG2101	1830141	PLUG
PG2851	5666145	MINI CONNECTOR
PG2852	5666151	MINI PLUG
PG2853	5665062	MINI PLUG
RJ1401	ER10181	JACK
S1201	5634884	SWITCH
S1202	5634884	SWITCH
S1203	5634884	SWITCH
S1204	5634884	SWITCH
S1205	5634884	SWITCH
S1206	5634884	SWITCH
S1207	5634884	SWITCH
S1208	5634884	SWITCH
S1212	5634884	SWITCH
S1213	5634884	SWITCH
S1214	5634884	SWITCH
S1215	5634884	SWITCH
S1216	5634884	SWITCH
S1217	5634884	SWITCH
S1301	5634884	SWITCH
S1302	5634884	SWITCH
S1303	5634884	SWITCH
S1304	5634884	SWITCH
S1305	5634884	SWITCH
S1306	5634884	SWITCH
S1307	5634884	SWITCH
S1308	5634884	SWITCH
S1309	5634884	SWITCH
S1310	5634884	SWITCH
S1311	5634884	SWITCH
S2101	5635631	SWITCH
S2102	5635331	SWITCH
S2104	5610891	SWITCH

CHAPTER 7 | SCHEMATIC AND CIRCUIT BOARD DIAGRAMS

Applied Models : VT-L1100E

Cautions when using schematic diagrams

Caution for safety

The parts marked ⚠ are critical for safety Be sure to use the specified parts to ensure safety when replacing them.

1. Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations.

〔Resistors〕

Item	Indication
Value	No indication .... Ω K .... k Ω M .... M Ω
Tolerance	No indication .... ± 5% (All tolerances other than ± 5% are indicated in the schematic diagrams)
Power capacitance	No indication .... 1/8W (1/16W for leadless resistors without indication) All capacitances other than the above are indicated in the schematic diagrams.

〔Capacitors〕

Item	Indication
Value	No indication .... μ F P .... pF
Dielectric strength	No indication .... 50V (All dielectric strengths other than 50V are indicated in the schematic diagrams.)

〔Coils〕

Item	Indication
Value	μ .... μ H m .... mH

2. Markings in schematic diagrams

1) Parts marked " ■ " with circuit numbers in the schematic diagrams are discrete parts.
2) Parts marked " ● " with circuit numbers in the schematic diagrams are leadless parts.

Cautions when using circuit board diagrams

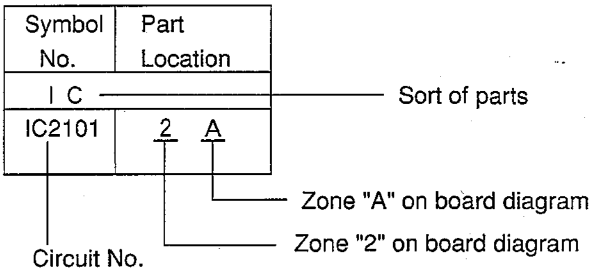
1. Identifications of sides A/B in circuit board diagrams

1) Board having a pattern on one side and parts on both sides.
   - Side A Shows discrete parts, viewed from the pattern side.
   - Side B Shows leadless parts, viewed from the pattern side.
2) Board having patterns on both sides and parts on both sides.
   - Side A Shows parts and patterns which can be seen when the case is opened.
   - Side B Shows parts and the pattern on the back of side A.

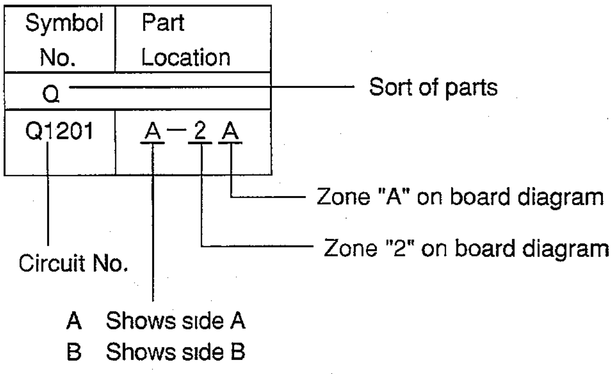
2. Table for indexing locations of parts

This table shows locations of each part on the circuit board diagrams. The locations are indicated using the guide scales on the external lines of diagrams.

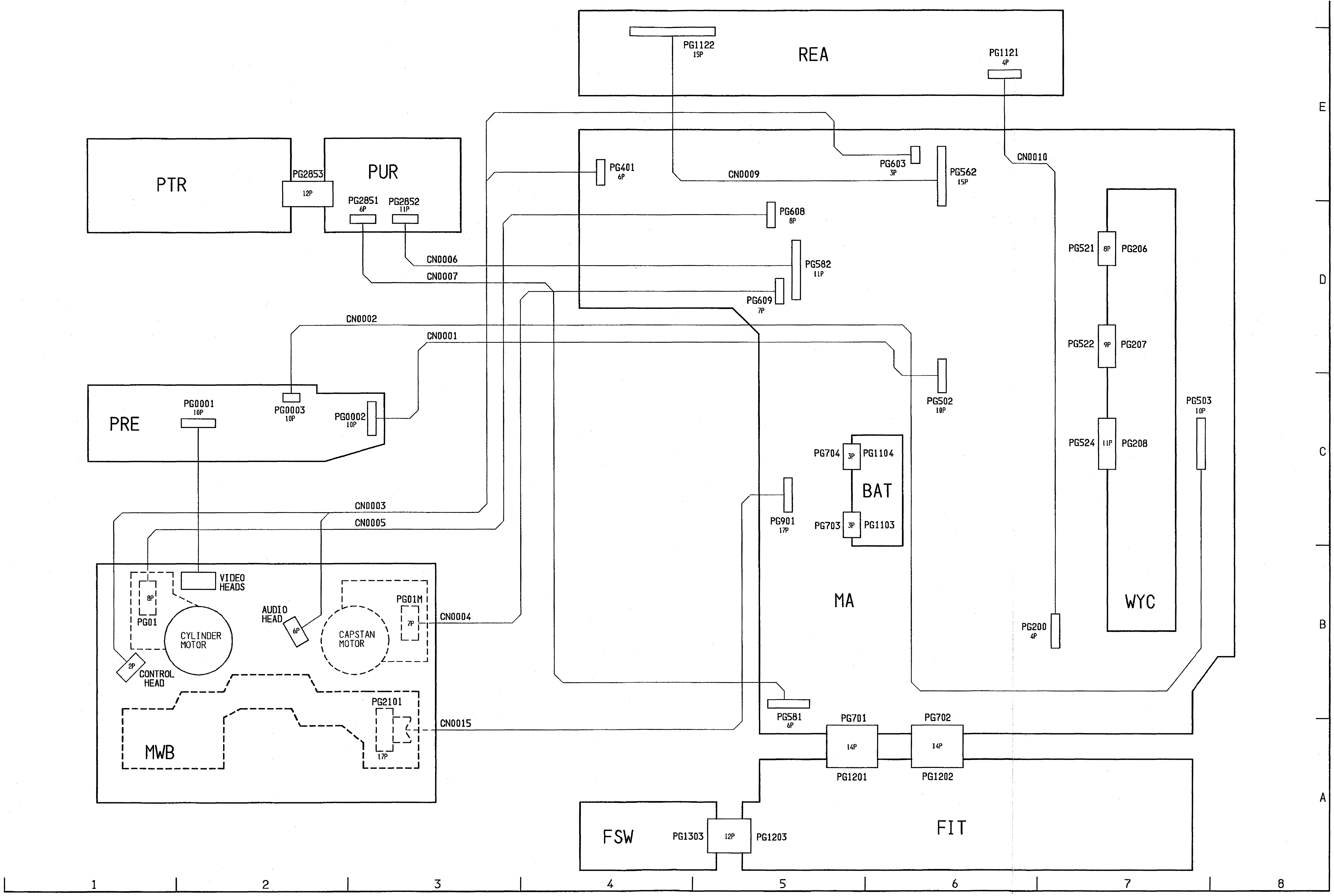
1) In case of one-layer board


Symbol No.
Part Location
I C
Sort of parts
IC2101
2 A
Zone "A" on board diagram
Zone "2" on board diagram
Circuit No.

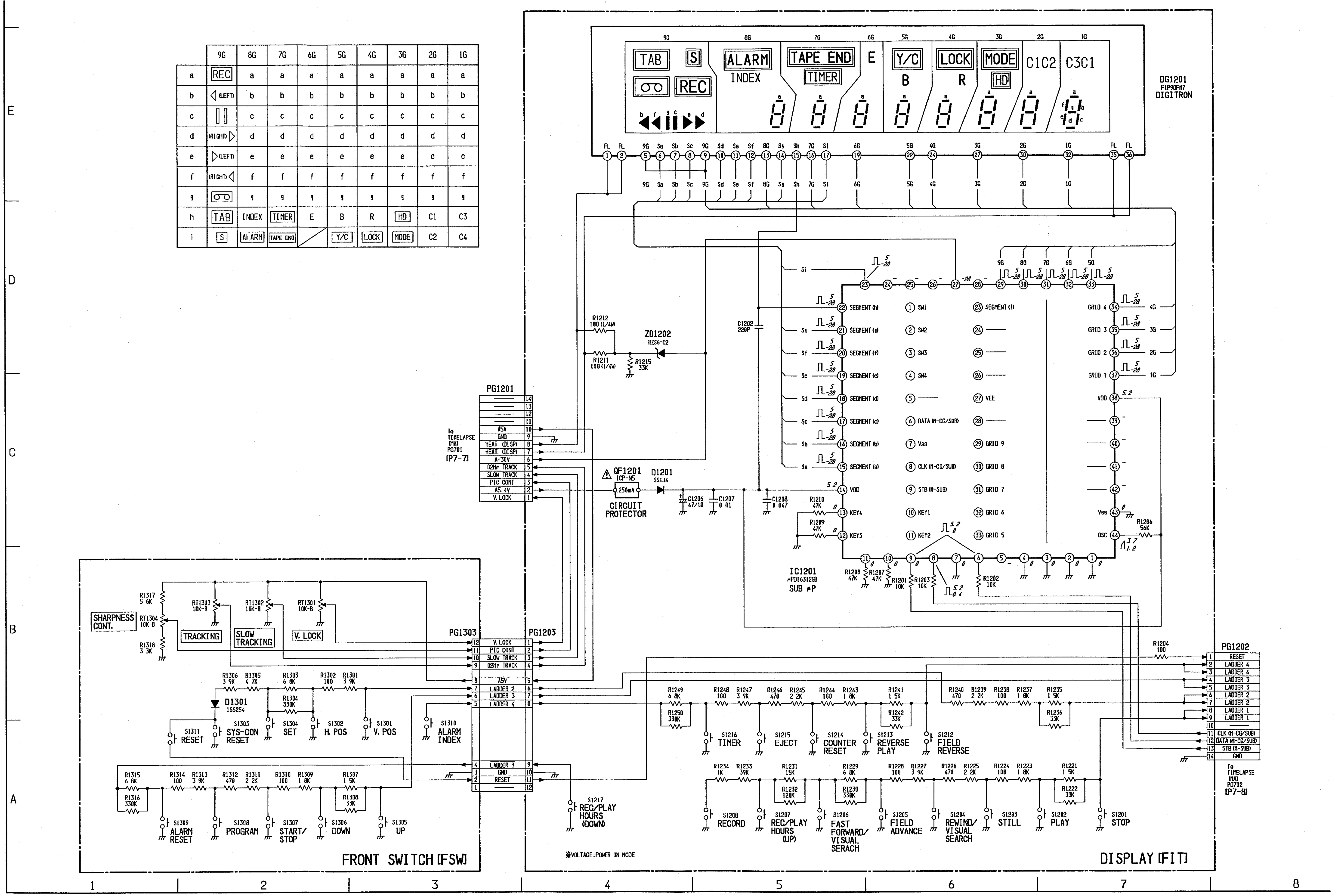
2) In case of side A/B indication board


Symbol No.
Part Location
Q
Sort of parts
Q1201
A－2 A
Zone "A" on board diagram
Zone "2" on board diagram
Circuit No.
A Shows side A
B Shows side B

CONNECTION DIAGRAM


REA
PG1122
15P
PG1121
4P
PTR
PUR
PG2853
12P
PG2851
6P
PG2852
11P
PG401
6P
PG603
3P
PG562
15P
CN0009
CN0010
PG608
8P
PG582
11P
CN0006
CN0007
PG609
7P
CN0002
CN0001
PG502
10P
PRE
PG0001
10P
PG0003
10P
PG0002
10P
PG521
8P
PG206
PG522
9P
PG207
PG524
11P
PG208
PG503
10P
PG704
3P
PG1104
BAT
PG703
3P
PG1103
PG901
17P
CN0003
CN0005
VIDEO
HEADS
8P
PG01
CYLINDER
MOTOR
AUDIO
HEAD
6P
CAPSTAN
MOTOR
PG01M
7P
CN0004
2P
CONTROL
HEAD
MA
WYC
PG200
4P
PG2101
17P
CN0015
MWB
PG581
6P
PG701
14P
PG702
14P
PG1201
PG1202
FSW
PG1303
12P
PG1203
FIT
E
D
C
B
A
1
2
3
4
5
6
7
8

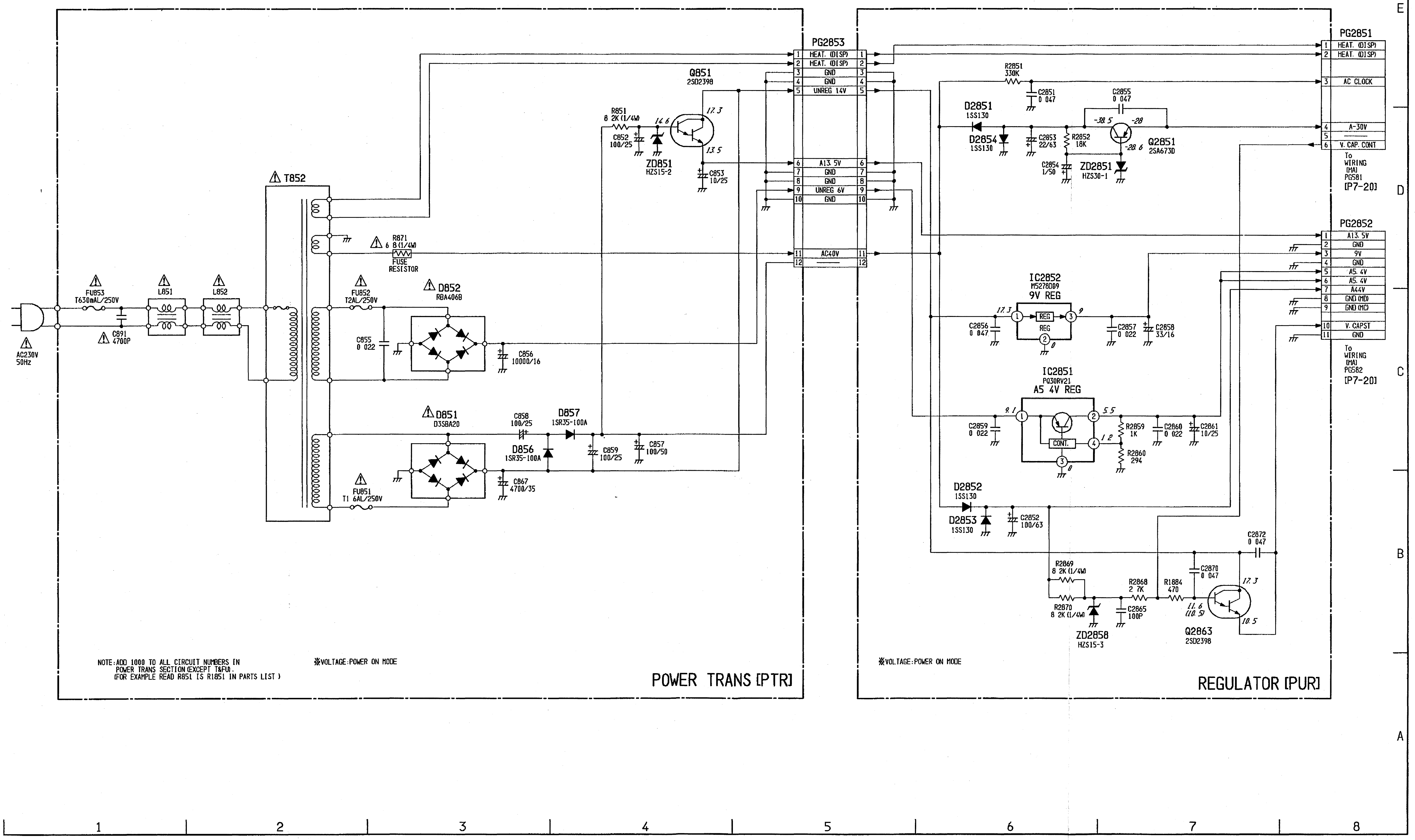
DISPLAY [FIT], FRONT SWITCH [FSW] SCHEMATIC DIAGRAMS



	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	REC	a	a	a	a	a	a	a	a
b	◁ (LEFT)	b	b	b	b	b	b	b	b
c	‖	c	c	c	c	c	c	c	c
d	(RIGHT) ▷	d	d	d	d	d	d	d	d
e	▷ (LEFT)	e	e	e	e	e	e	e	e
f	(RIGHT) ◁	f	f	f	f	f	f	f	f
g	oo	g	g	g	g	g	g	g	g
h	TAB	INDEX	TIMER	E	B	R	HD	C1	C3
i	S	ALARM	TAPE END		Y/C	LOCK	MODE	C2	C4

DG1201
FIP9DFH7
DIGITRON
TAB
S
ALARM
INDEX
TAPE END
TIMER
E
Y/C
B
LOCK
R
MODE
HD
C1C2
C3C1
REC
PG1201
To TIMELAPSE (M) PG701 [P7-7]
A5V
GND
HEAT. (DISP)
A-30V
02Hr TRACK
SLOW TRACK
PIC CONT
A5.4V
V. LOCK
R1212 100 (1/4W)
R1211 100 (1/4W)
ZD1202 HZS6-C2
R1215 33K
C1202 220P
QF1201 ICP-N5
250mA
D1201 SS1J4
CIRCUIT PROTECTOR
C1206 47/10
C1207 0.01
C1208 0.047
R1210 47K
R1209 47K
IC1201
μPD16312GB
SUB μP
SEGMENT (h)
SEGMENT (g)
SEGMENT (f)
SEGMENT (e)
SEGMENT (d)
SEGMENT (c)
SEGMENT (b)
SEGMENT (a)
VDD
KEY4
KEY3
SW1
SW2
SW3
SW4
DATA (M-CG/SUB)
Vss
CLK (M-CG/SUB)
STB (M-SUB)
KEY1
KEY2
SEGMENT (i)
VEE
GRID 9
GRID 8
GRID 7
GRID 6
GRID 5
GRID 4
GRID 3
GRID 2
GRID 1
OSC
R1206 56K
R1208 47K
R1207 47K
R1201 10K
R1203 10K
R1202 10K
R1204 100
PG1202
RESET
LADDER 4
LADDER 3
LADDER 2
LADDER 1
CLK (M-CG/SUB)
DATA (M-CG/SUB)
STB (M-SUB)
GND
To TIMELAPSE (M) PG702 [P7-8]
SHARPNESS CONT.
R1317 5.6K
RT1304 10K-B
R1318 3.3K
RT1303 10K-B
TRACKING
RT1302 10K-B
SLOW TRACKING
RT1301 10K-B
V. LOCK
PG1303
PG1203
D1301 1SS254
S1311 RESET
S1303 SYS-CON RESET
S1304 SET
S1302 H. POS
S1301 V. POS
S1310 ALARM INDEX
S1309 ALARM RESET
S1308 PROGRAM
S1307 START/STOP
S1306 DOWN
S1305 UP
S1217 REC/PLAY HOURS (DOWN)
S1216 TIMER
S1215 EJECT
S1214 COUNTER RESET
S1213 REVERSE PLAY
S1212 FIELD REVERSE
S1208 RECORD
S1207 REC/PLAY HOURS (UP)
S1206 FAST FORWARD/ VISUAL SERACH
S1205 FIELD ADVANCE
S1204 REWIND/ VISUAL SEARCH
S1203 STILL
S1202 PLAY
S1201 STOP
※VOLTAGE:POWER ON MODE
FRONT SWITCH [FSW]
DISPLAY [FIT]

POWER TRANS [PTR]. REGULATOR [PUR] SCHEMATIC DIAGRAMS

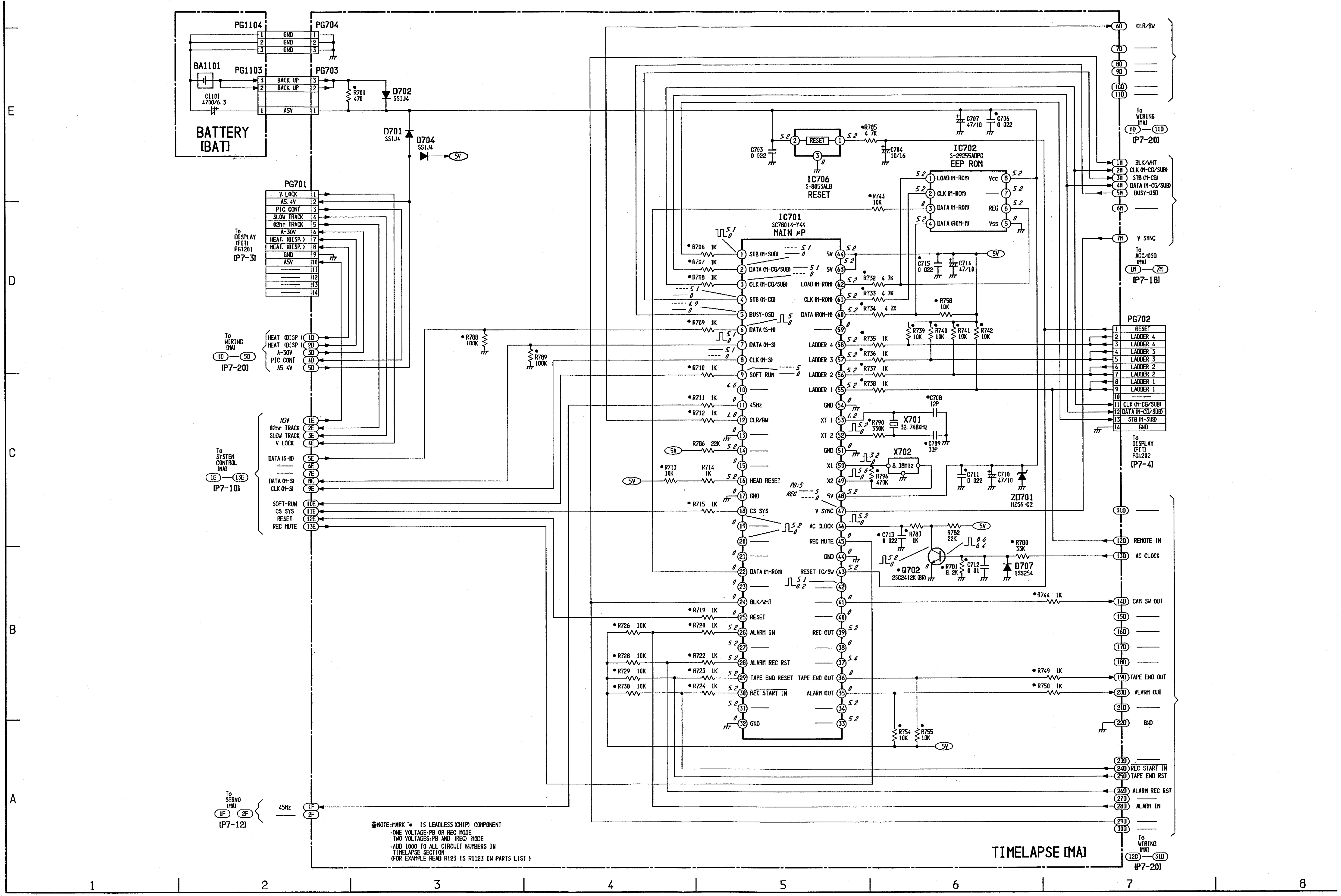

PG2853
1 HEAT. (DISP) 1
2 HEAT. (DISP) 2
3 GND 3
4 GND 4
5 UNREG 14V 5
6 A13. 5V 6
7 GND 7
8 GND 8
9 UNREG 6V 9
10 GND 10
11 AC40V 11
12 ——— 12
Q851
2SD2398
R851
8 2K (1/4W)
14. 6
17. 3
13. 5
C852
100/25
ZD851
HZS15-2
C853
10/25
T852
R871
6 8 (1/4W)
FUSE
RESISTOR
FU853
T630mAL/250V
L851
L852
C891
4700P
AC230V
50Hz
FU852
T2AL/250V
D852
RBA406B
C855
0 022
C856
10000/16
D851
D3SBA20
C858
100/25
D857
1SR35-100A
D856
1SR35-100A
C859
100/25
C857
100/50
C867
4700/35
FU851
T1 6AL/250V
POWER TRANS [PTR]
PG2851
1 HEAT. (DISP)
2 HEAT. (DISP)
3 AC CLOCK
4 A-30V
5 ———
6 V. CAP. CONT
To
WIRING
[MA]
PG581
[P7-20]
R2851
330K
C2851
0 047
C2855
0 047
D2851
1SS130
D2854
1SS130
C2853
22/63
R2852
18K
-38. 5
-28
-28. 6
Q2851
2SA673D
C2854
1/50
ZD2851
HZS30-1
PG2852
1 A13. 5V
2 GND
3 9V
4 GND
5 A5. 4V
6 A5. 4V
7 A44V
8 GND (MD)
9 GND (MC)
10 V. CAPST
11 GND
To
WIRING
[MA]
PG582
[P7-20]
IC2852
M5278D09
9V REG
17. 3
REG
REG
9
0
C2856
0 047
C2857
0 022
C2858
33/16
IC2851
PQ30RV21
A5 4V REG
9. 1
5. 5
1. 2
0
CONT.
C2859
0 022
R2859
1K
R2860
294
C2860
0 022
C2861
10/25
D2852
1SS130
D2853
1SS130
C2852
100/63
C2872
0 047
R2869
8 2K (1/4W)
R2870
8 2K (1/4W)
ZD2858
HZS15-3
R2868
2 7K
C2865
100P
R1884
470
C2870
0 047
11. 6
(10. 5)
17. 3
10. 5
Q2863
2SD2398
REGULATOR [PUR]
E
D
C
B
A
1
2
3
4
5
6
7
8

NOTE: ADD 1000 TO ALL CIRCUIT NUMBERS IN
POWER TRANS SECTION (EXCEPT T&FU).
(FOR EXAMPLE READ R851 IS R1851 IN PARTS LIST)

※VOLTAGE: POWER ON MODE

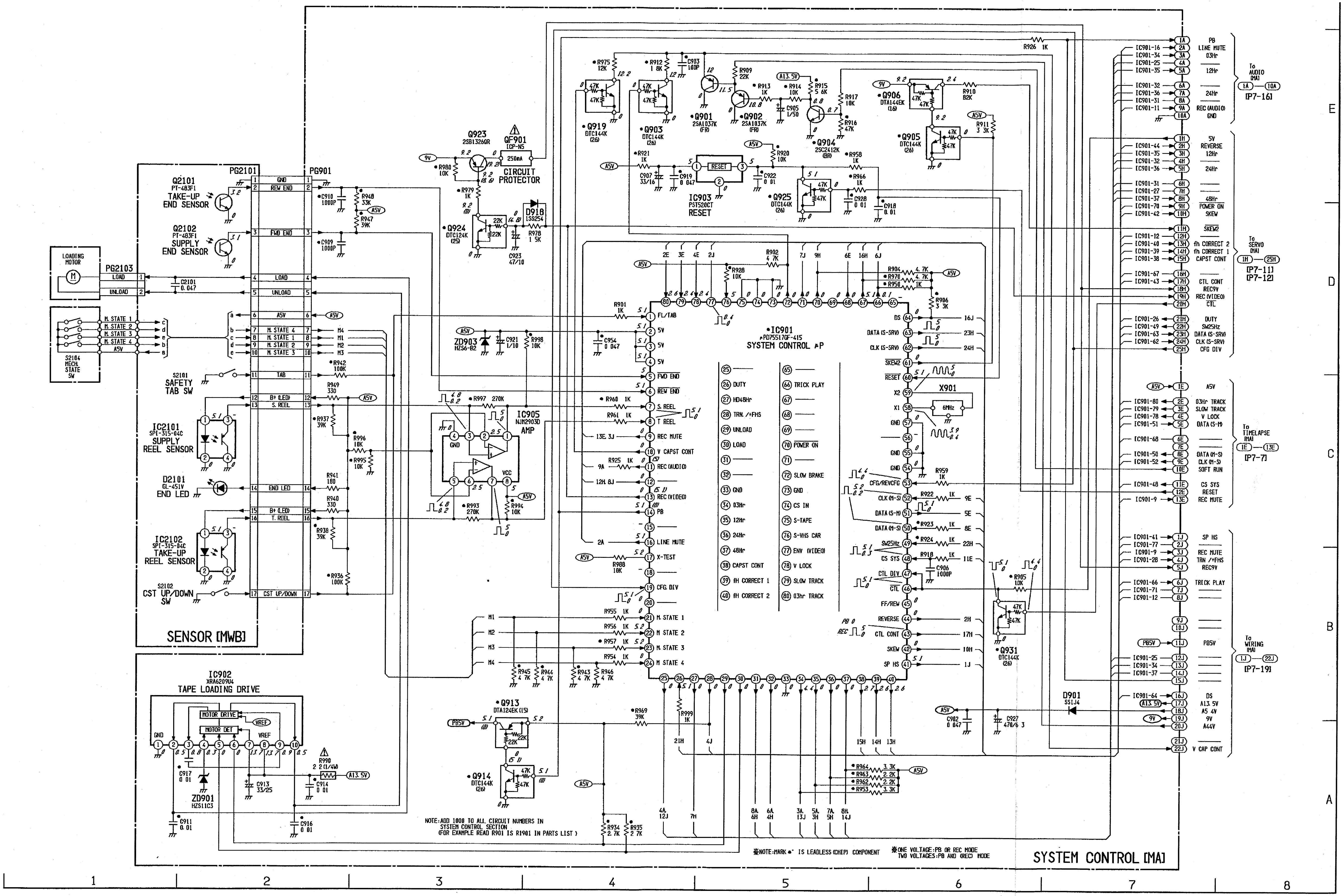
※VOLTAGE: POWER ON MODE

TIMELAPSE [MA] . BATTERY [BAT] SCHEMATIC DIAGRAMS


PG1104
PG704
GND
BA1101
PG1103
PG703
BACK UP
C1101 4700/6.3
A5V
R701 470
D702 SS1J4
D701 SS1J4
D704 SS1J4
5V
BATTERY [BAT]
PG701
V. LOCK
A5.4V
PIC CONT
SLOW TRACK
02hr TRACK
A-30V
HEAT. (DISP.)
To DISPLAY (FT) PG1201 [P7-3]
To WIRING (MA) 1D — 5D [P7-20]
HEAT (DISP)
To SYSTEM CONTROL (MA) 1E — 13E [P7-10]
DATA (S-M)
DATA (M-S)
CLK (M-S)
SOFT-RUN
CS SYS
RESET
REC MUTE
To SERVO (MA) 1F 2F [P7-12]
45Hz
R788 100K
R789 100K
IC706 S-8053ALB RESET
C703 0.022
R705 4.7K
C704 10/16
C707 47/10
C706 0.022
IC702 S-29255ADPG EEP ROM
LOAD (M-ROM)
CLK (M-ROM)
DATA (M-ROM)
DATA (ROM-M)
Vcc
REG
Vss
R743 10K
IC701 SC78014-Y44 MAIN µP
STB (M-SUB)
DATA (M-CG/SUB)
CLK (M-CG/SUB)
STB (M-CG)
BUSY-OSD
SOFT RUN
CLR/BW
HEAD RESET
BLK/WHT
ALARM IN
ALARM REC RST
TAPE END RESET
REC START IN
LADDER 4
LADDER 3
LADDER 2
LADDER 1
X701 32.768KHz
X702 8.38MHz
C708 12P
C709 33P
R790 330K
R796 470K
V SYNC
AC CLOCK
RESET IC/SW
REC OUT
TAPE END OUT
ALARM OUT
C715 0.022
C714 47/10
R758 10K
R739 10K
R740 10K
R741 10K
R742 10K
C711 0.022
C710 47/10
ZD701 HZS6-C2
C713 0.022
R783 1K
R782 22K
R780 33K
Q702 2SC2412K (BR)
R781 8.2K
C712 0.01
D707 1SS254
R754 10K
R755 10K
R744 1K
R749 1K
R750 1K
To WIRING (MA) 6D — 11D [P7-20]
BLK/WHT
CLK (M-CG/SUB)
STB (M-CG)
DATA (M-CG/SUB)
BUSY-OSD
To AGC/OSD (MA) 1M — 7M [P7-18]
PG702
STB (M-SUB)
To DISPLAY (FT) PG1202 [P7-4]
REMOTE IN
CAM SW OUT
REC START IN
TAPE END RST
ALARM REC RST
To WIRING (MA) 12D — 31D [P7-20]
TIMELAPSE [MA]

※NOTE: MARK "●" IS LEADLESS (CHIP) COMPONENT
:ONE VOLTAGE: PB OR REC MODE
TWO VOLTAGES: PB AND (REC) MODE
:ADD 1000 TO ALL CIRCUIT NUMBERS IN
TIMELAPSE SECTION
(FOR EXAMPLE READ R123 IS R1123 IN PARTS LIST)

SYSTEM CONTROL [MA], SENSOR [MWB] SCHEMATIC DIAGRAMS

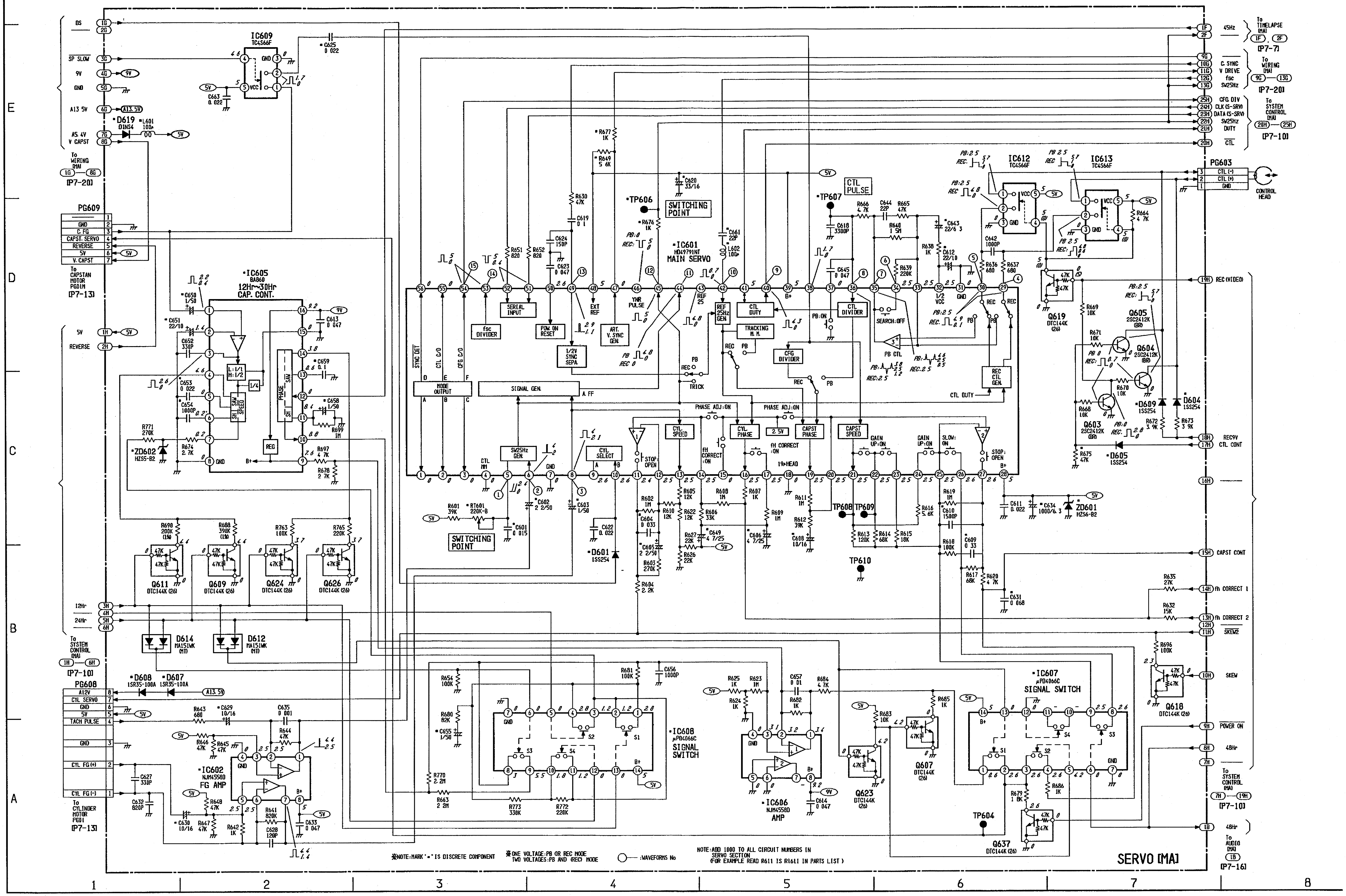

SENSOR [MWB]
SYSTEM CONTROL [MA]
LOADING MOTOR
PG2103
LOAD
UNLOAD
C2101 0.047
S2104 MECH. STATE SW
M. STATE 1
M. STATE 2
M. STATE 3
M. STATE 4
A5V
PG2101
PG901
GND
REW END
FWD END
LOAD
UNLOAD
A5V
M. STATE 4
M. STATE 1
M. STATE 2
M. STATE 3
TAB
B+ (LED)
S. REEL
END LED
B+ (LED)
T. REEL
CST UP/DOWN
Q2101 PT-483F1 TAKE-UP END SENSOR
Q2102 PT-483F1 SUPPLY END SENSOR
S2101 SAFETY TAB SW
IC2101 SPI-315-04C SUPPLY REEL SENSOR
D2101 GL-451V END LED
IC2102 SPI-315-04C TAKE-UP REEL SENSOR
S2102 CST UP/DOWN SW
C910 1000P
R948 33K
R947 39K
C909 1000P
R942 100K
R949 330
R937 39K
R996 10K
R995 10K
R941 180
R940 330
R938 39K
R936 100K
M4
M1
M2
M3
Q923 2SB1326QR
QF901 ICP-N5 250mA CIRCUIT PROTECTOR
R980 10K
R979 1K
D918 1SS254
Q924 DTC124K (25)
R978 1.5K
C923 47/10
ZD903 HZS6-B2
C921 1/10
R998 10K
R997 270K
IC905 NJM2903D AMP
GND
VCC
R993 270K
R994 10K
Q919 DTC144K (26)
R975 12K
Q903 DTC144K (26)
R912 1.8K
C903 100P
Q901 2SA1037K (FR)
R909 22K
Q902 2SA1037K (FR)
R913 1K
R914 10K
C905 1/50
R915 5.6K
Q904 2SC2412K (BR)
R917 10K
R916 47K
Q906 DTA144EK (16)
R910 82K
Q905 DTC144K (26)
R911 3.3K
R921 1K
C907 33/16
C919 0.047
IC903 PST520CT RESET
C922 0.01
R920 10K
Q925 DTC144K (26)
R958 1K
R966 1K
C928 0.01
C918 0.01
R926 1K
IC901 μPD75517GF-415 SYSTEM CONTROL μP
R901 1K
R902 4.7K
R928 10K
R904 4.7K
R970 4.7K
R950 1K
R906 3.3K
C954 0.047
FL/TAB
5V
5V
5V
FWD END
REW END
S. REEL
T REEL
REC MUTE
V CAPST CONT
REC (AUDIO)
REC (VIDEO)
PB
LINE MUTE
X-TEST
CFG DIV
M. STATE 1
M STATE 2
M. STATE 3
M STATE 4
R960 1K
R961 1K
R925 1K
R988 10K
R955 1K
R956 1K
R957 1K
R954 1K
R945 4.7K
R944 4.7K
R943 4.7K
R946 4.7K
(25) —
(26) DUTY
(27) HD48Hr
(28) TRN./+FHS
(29) UNLOAD
(30) LOAD
(31) —
(32) —
(33) GND
(34) 03Hr
(35) 12Hr
(36) 24Hr
(37) 48Hr
(38) CAPST CONT
(39) fH CORRECT 1
(40) fH CORRECT 2
(65) —
(66) TRICK PLAY
(67) —
(68) —
(69) —
(70) POWER ON
(71) —
(72) SLOW BRAKE
(73) GND
(74) CS IN
(75) S-TAPE
(76) S-VHS CAR
(77) ENV (VIDEO)
(78) V LOCK
(79) SLOW TRACK
(80) 03Hr TRACK
DS
DATA (S-SRV)
CLK (S-SRV)
SKEW2
RESET
X2
X1
X901 6MHz
GND
GND
GND
CFG/REVCFG
CLK (M-S)
DATA (S-M)
DATA (M-S)
SW25Hz
CS SYS
CTL DIV
CTL
FF/REW
REVERSE
CTL CONT
SKEW
SP HS
R959 1K
R922 1K
R923 1K
R924 1K
R918 1K
C906 1000P
R905 10K
Q931 DTC144K (26)
D901 SS1J4
C902 0.047
C927 470/6.3
R999 1K
R969 39K
R964 3.3K
R963 2.2K
R962 2.2K
R953 3.3K
R934 2.7K
R935 2.7K
Q913 DTA124EK (15)
Q914 DTC144K (26)
IC902 XRA6209U4 TAPE LOADING DRIVE
MOTOR DRIVE
MOTOR DET
VREF
GND
R990 2.2(1/4W)
C917 0.01
ZD901 HZS11C3
C913 33/25
C914 0.01
C911 0.01
C916 0.01
A5V
A13.5V
9V
PB5V
IC901-16
IC901-34
IC901-25
IC901-35
IC901-32
IC901-36
IC901-31
IC901-11
PB LINE MUTE
03Hr
12Hr
24Hr
REC (AUDIO)
GND
To AUDIO [MA] (1A)—(10A) [P7-16]
IC901-44
IC901-35
IC901-32
IC901-36
IC901-31
IC901-27
IC901-37
IC901-70
IC901-42
IC901-12
IC901-40
IC901-39
IC901-38
IC901-67
IC901-43
IC901-26
IC901-49
IC901-63
IC901-62
5V
REVERSE
12Hr
24Hr
48Hr
POWER ON
SKEW
SKEW2
fH CORRECT 2
fH CORRECT 1
CAPST CONT
CTL CONT
REC9V
REC (VIDEO)
CTL
DUTY
SW25Hz
DATA (S-SRV)
CLK (S-SRV)
CFG DIV
To SERVO [MA] (1H)—(25H) [P7-11] [P7-12]
IC901-80
IC901-79
IC901-78
IC901-51
IC901-68
IC901-50
IC901-52
IC901-48
IC901-9
A5V
03Hr TRACK
SLOW TRACK
V LOCK
DATA (S-M)
DATA (M-S)
CLK (M-S)
SOFT RUN
CS SYS
RESET
REC MUTE
To TIMELAPSE [MA] (1E)—(13E) [P7-7]
IC901-41
IC901-77
IC901-9
IC901-28
IC901-66
IC901-71
IC901-12
IC901-25
IC901-34
IC901-37
IC901-64
SP HS
REC MUTE
TRN /+FHS
REC9V
TRICK PLAY
PB5V
DS
A13.5V
A5 4V
9V
A44V
V CAP CONT
To WIRING [MA] (1J)—(22J) [P7-19]
1
2
3
4
5
6
7
8
A
B
C
D
E

NOTE: ADD 1000 TO ALL CIRCUIT NUMBERS IN SYSTEM CONTROL SECTION (FOR EXAMPLE READ R901 IS R1901 IN PARTS LIST)

※NOTE: MARK • IS LEADLESS (CHIP) COMPONENT

※ONE VOLTAGE: PB OR REC MODE
TWO VOLTAGES: PB AND (REC) MODE

SERVO [MA] SCHEMATIC DIAGRAM


IC609 TC4S66F
*IC605 BA860 12Hr~30Hr CAP. CONT.
*IC601 HD49791NT MAIN SERVO
IC612 TC4S66F
IC613 TC4S66F
*IC602 NJM4558D FG AMP
*IC608 μPD4066C SIGNAL SWITCH
*IC606 NJM4558D AMP
*IC607 μPD4066C SIGNAL SWITCH
PG609
PG608
PG603
*TP606
*TP607
TP608
TP609
TP610
TP604
SWITCHING POINT
CTL PULSE
D619 D1NS4
D614 MA151WK
D612 MA151WK
*D608 1SR35-100A
*D607 1SR35-100A
*D601 1SS254
*ZD602 HZS5-B2
ZD601 HZS6-B2
*D609 1SS254
D604 1SS254
*D605 1SS254
Q611 DTC144K (26)
Q609 DTC144K (26)
Q624 DTC144K (26)
Q626 DTC144K (26)
Q619 DTC144K (26)
Q605 2SC2412K
Q604 2SC2412K
Q603 2SC2412K
Q618 DTC144K (26)
Q607 DTC144K (26)
Q623 DTC144K (26)
Q637 DTC144K (26)
To TIMELAPSE [MA] [P7-7]
To WIRING [MA] [P7-20]
To SYSTEM CONTROL [MA] [P7-10]
To CAPSTAN MOTOR PG01M [P7-13]
To CYLINDER MOTOR PG01 [P7-13]
To AUDIO [MA] [P7-16]
CONTROL HEAD
E
D
C
B
A
1
2
3
4
5
6
7
8
SERVO [MA]

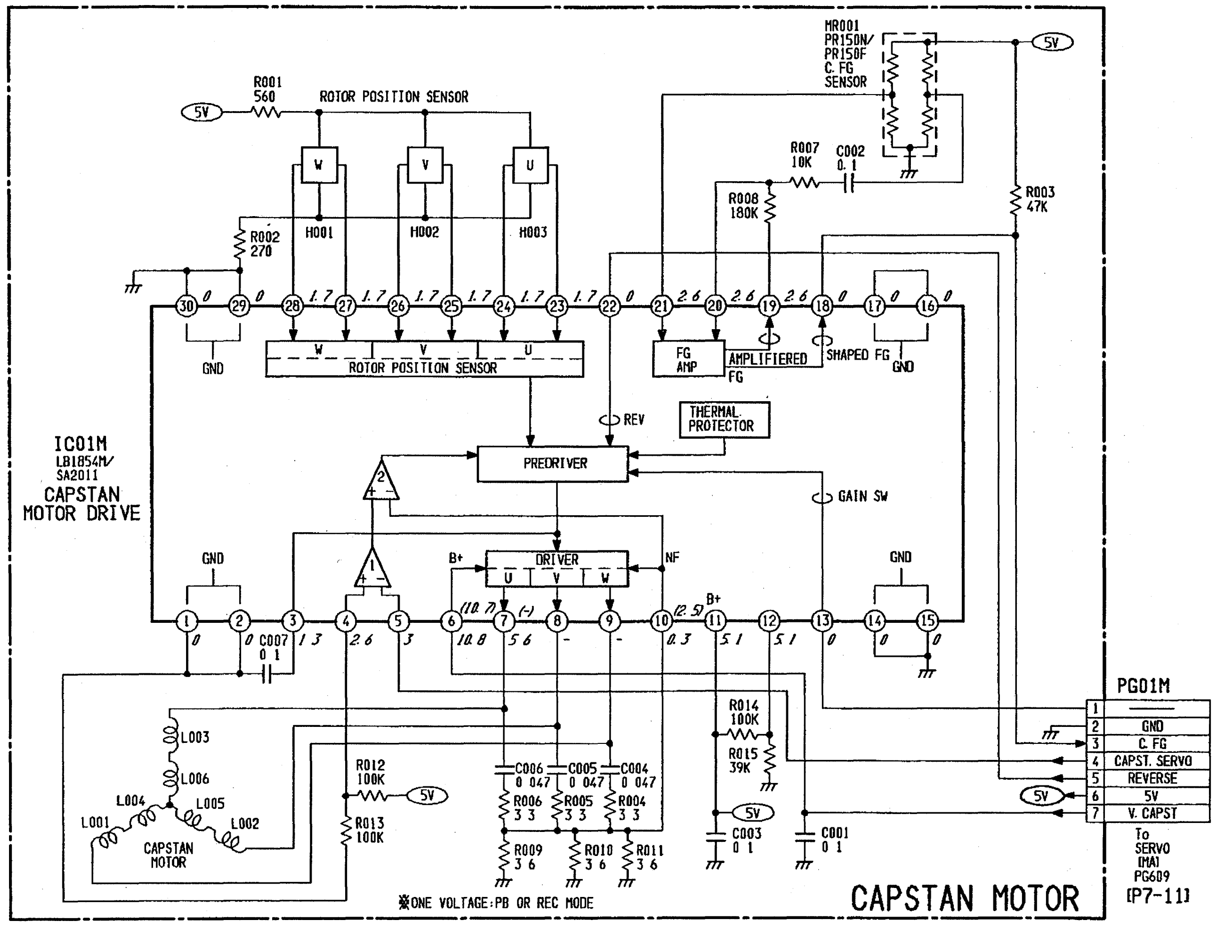
※NOTE:MARK "*" IS DISCRETE COMPONENT

※ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

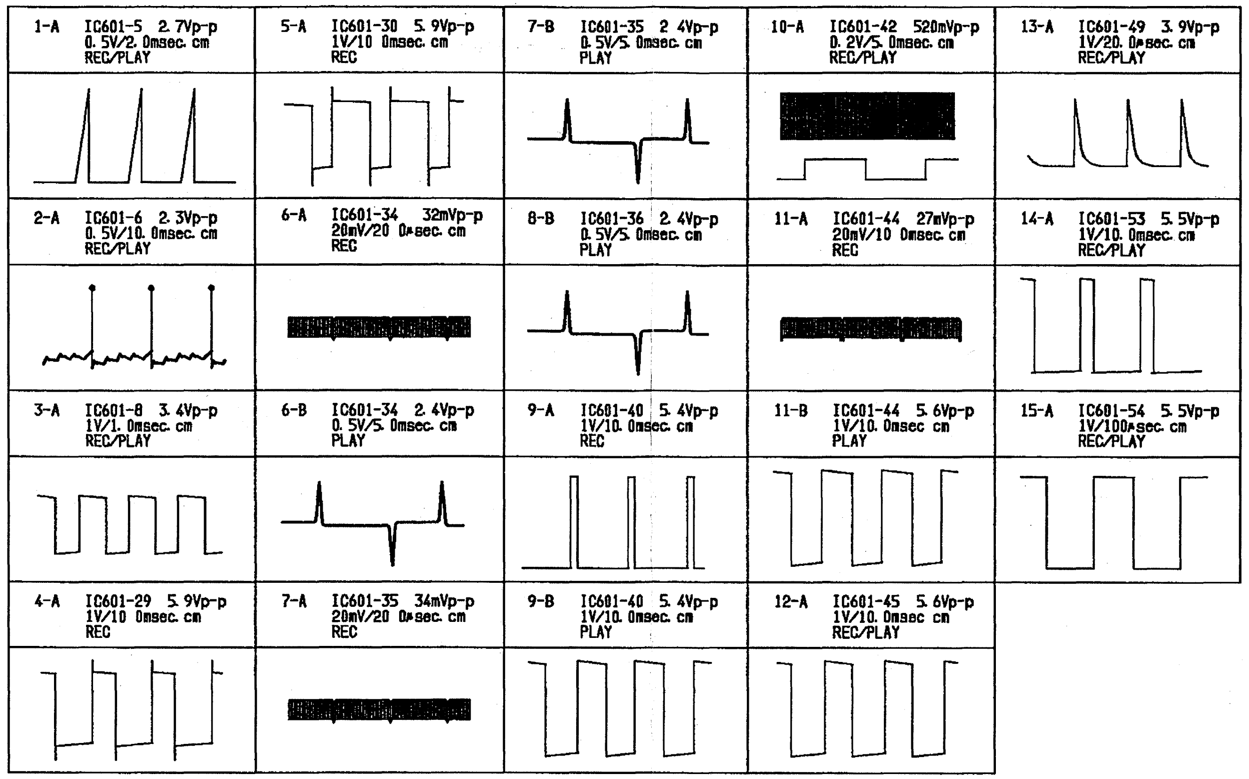
○ :WAVEFORMS No

NOTE:ADD 1000 TO ALL CIRCUIT NUMBERS IN SERVO SECTION
(FOR EXAMPLE READ R611 IS R1611 IN PARTS LIST)

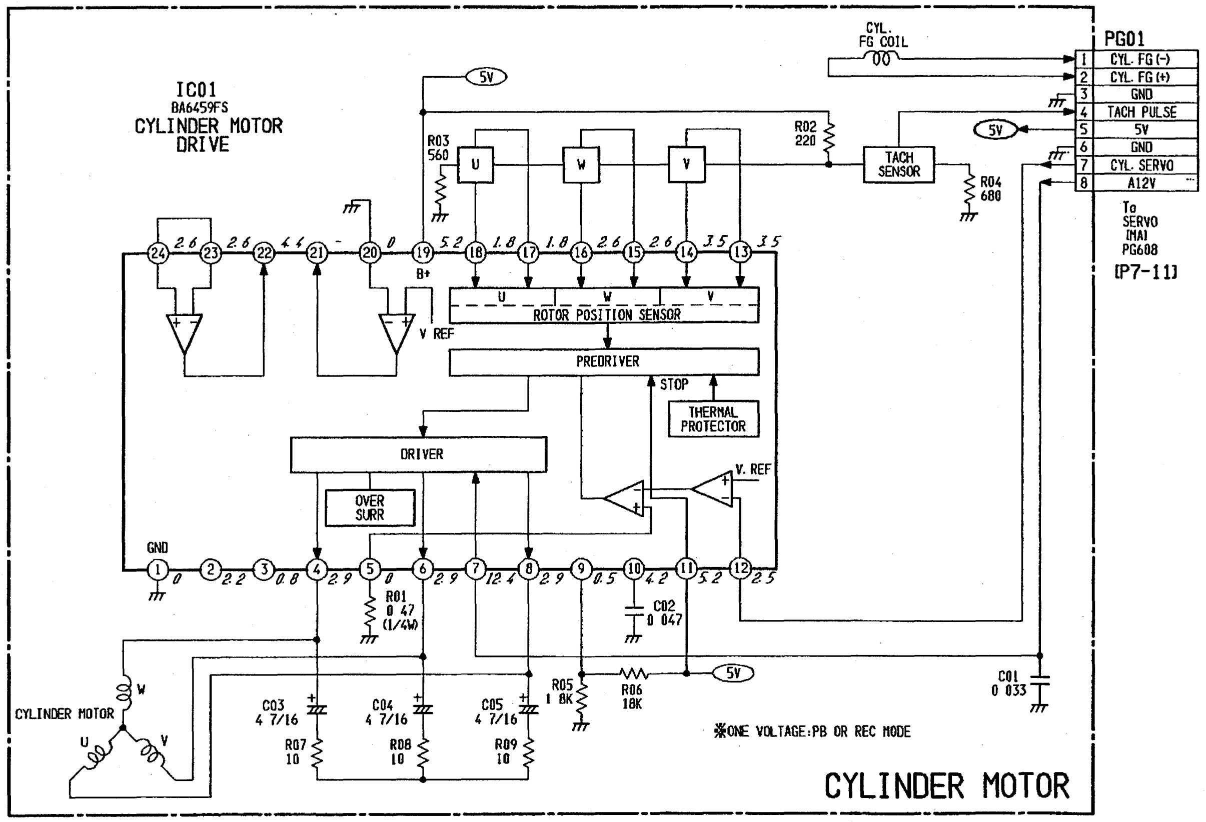
CAPSTAN MOTOR SCHEMATIC DIAGRAM


MR001 PR150N/ PR150F C.FG SENSOR
5V
R001 560
ROTOR POSITION SENSOR
W
V
U
H001
H002
H003
R002 270
R007 10K
C002 0.1
R008 180K
R003 47K
GND
ROTOR POSITION SENSOR
FG AMP
AMPLIFIERED FG
SHAPED FG
REV
THERMAL PROTECTOR
PREDRIVER
GAIN SW
IC01M LB1854M/ SA2011 CAPSTAN MOTOR DRIVE
DRIVER
B+
NF
C007 0.1
PG01M
GND
C.FG
CAPST. SERVO
REVERSE
5V
V. CAPST
To SERVO (MA) PG609 [P7-11]
L003
L006
L004
L005
L001
L002
CAPSTAN MOTOR
R012 100K
R013 100K
C006 0.047
C005 0.047
C004 0.047
R006 3.3
R005 3.3
R004 3.3
R009 3.6
R010 3.6
R011 3.6
R014 100K
R015 39K
C003 0.1
C001 0.1
※ONE VOLTAGE:PB OR REC MODE
CAPSTAN MOTOR

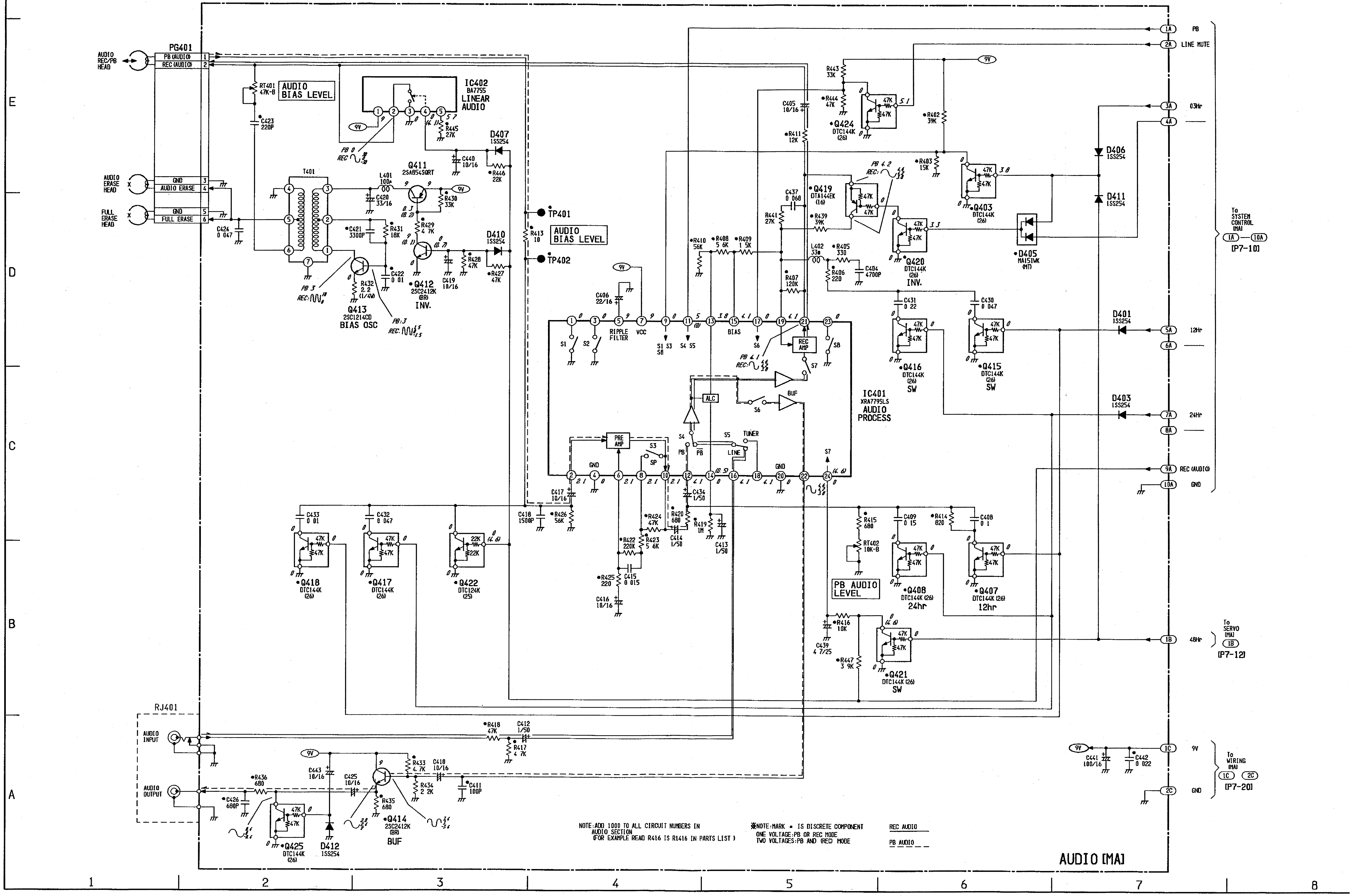
SERVO WAVEFORMS



CYLINDER MOTOR SCHEMATIC DIAGRAM


IC01 BA6459FS CYLINDER MOTOR DRIVE
5V
CYL. FG COIL
PG01
CYL. FG(-)
CYL. FG(+)
GND
TACH PULSE
5V
GND
CYL. SERVO
A12V
To SERVO (MA) PG608 [P7-11]
R03 560
U
W
V
R02 220
TACH SENSOR
R04 680
B+
V REF
ROTOR POSITION SENSOR
PREDRIVER
STOP
THERMAL PROTECTOR
DRIVER
OVER SURR
V. REF
GND
R01 0.47 (1/4W)
C02 0.047
C01 0.033
R05 1.8K
R06 18K
CYLINDER MOTOR
C03 4.7/16
C04 4.7/16
C05 4.7/16
R07 10
R08 10
R09 10
※ONE VOLTAGE:PB OR REC MODE
CYLINDER MOTOR

AUDIO [MA] SCHEMATIC DIAGRAM



PG401
AUDIO REC/PB HEAD
PB (AUDIO)
REC (AUDIO)
AUDIO ERASE HEAD
GND
AUDIO ERASE
FULL ERASE HEAD
FULL ERASE
RT401 47K-B
AUDIO BIAS LEVEL
C423 220P
C424 0.047
T401
IC402 BA7755 LINEAR AUDIO
9V
Q411 2SA854SQRT
L401 100µ
C420 33/16
R430 33K
C421 3300P
R431 18K
R429 4.7K
Q412 2SC2412K (BR) INV.
Q413 2SC1214C(D) BIAS OSC
R432 2.2 (1/4W)
C422 0.01
C419 10/16
R428 47K
R427 47K
D407 1SS254
D410 1SS254
C440 10/16
R445 27K
R446 22K
TP401
TP402
R413 10
AUDIO BIAS LEVEL
C406 22/16
RIPPLE FILTER
VCC
BIAS
S1 S2 S3 S4 S5 S6 S7 S8
REC AMP
ALC
BUF
PRE AMP
PB
LINE
TUNER
SP
GND
IC401 XRA7795LS AUDIO PROCESS
R410 56K
R408 5.6K
R409 1.5K
R441 27K
R439 39K
C437 0.068
R411 12K
C405 10/16
R443 33K
R444 47K
Q424 DTC144K (26)
R402 39K
R403 15K
Q419 DTA144EK (16)
Q403 DTC144K (26)
Q420 DTC144K (26) INV.
L402 33m
R405 330
C404 4700P
R406 220
R407 120K
D406 1SS254
D411 1SS254
D405 MA151WK (M1)
C431 0.22
C430 0.047
Q416 DTC144K (26) SW
Q415 DTC144K (26) SW
D401 1SS254
D403 1SS254
C417 10/16
C418 1500P
R426 56K
R424 47K
R420 680
C434 1/50
R419 1M
C413 1/50
C414 1/50
R422 220K
R423 5.6K
R425 220
C415 0.015
C416 10/16
C433 0.01
C432 0.047
Q418 DTC144K (26)
Q417 DTC144K (26)
Q422 DTC124K (25)
R415 680
RT402 10K-B
PB AUDIO LEVEL
C409 0.15
R414 820
C408 0.1
Q408 DTC144K (26) 24hr
Q407 DTC144K (26) 12hr
R416 10K
C439 4.7/25
R447 3.9K
Q421 DTC144K (26) SW
RJ401
AUDIO INPUT
AUDIO OUTPUT
R418 47K
C412 1/50
R417 4.7K
C443 10/16
C425 10/16
R436 680
C426 680P
Q425 DTC144K (26)
D412 1SS254
R433 4.7K
C410 10/16
R434 2.2K
C411 100P
R435 680
Q414 2SC2412K (BR) BUF
1A PB
2A LINE MUTE
3A 03Hr
4A
5A 12Hr
6A
7A 24Hr
8A
9A REC (AUDIO)
10A GND
To SYSTEM CONTROL (MA) 1A–10A [P7-10]
1B 48Hr
To SERVO (MA) 1B [P7-12]
1C 9V
2C GND
C441 100/16
C442 0.022
To WIRING (MA) 1C 2C [P7-20]
AUDIO [MA]
1 2 3 4 5 6 7 8
A B C D E

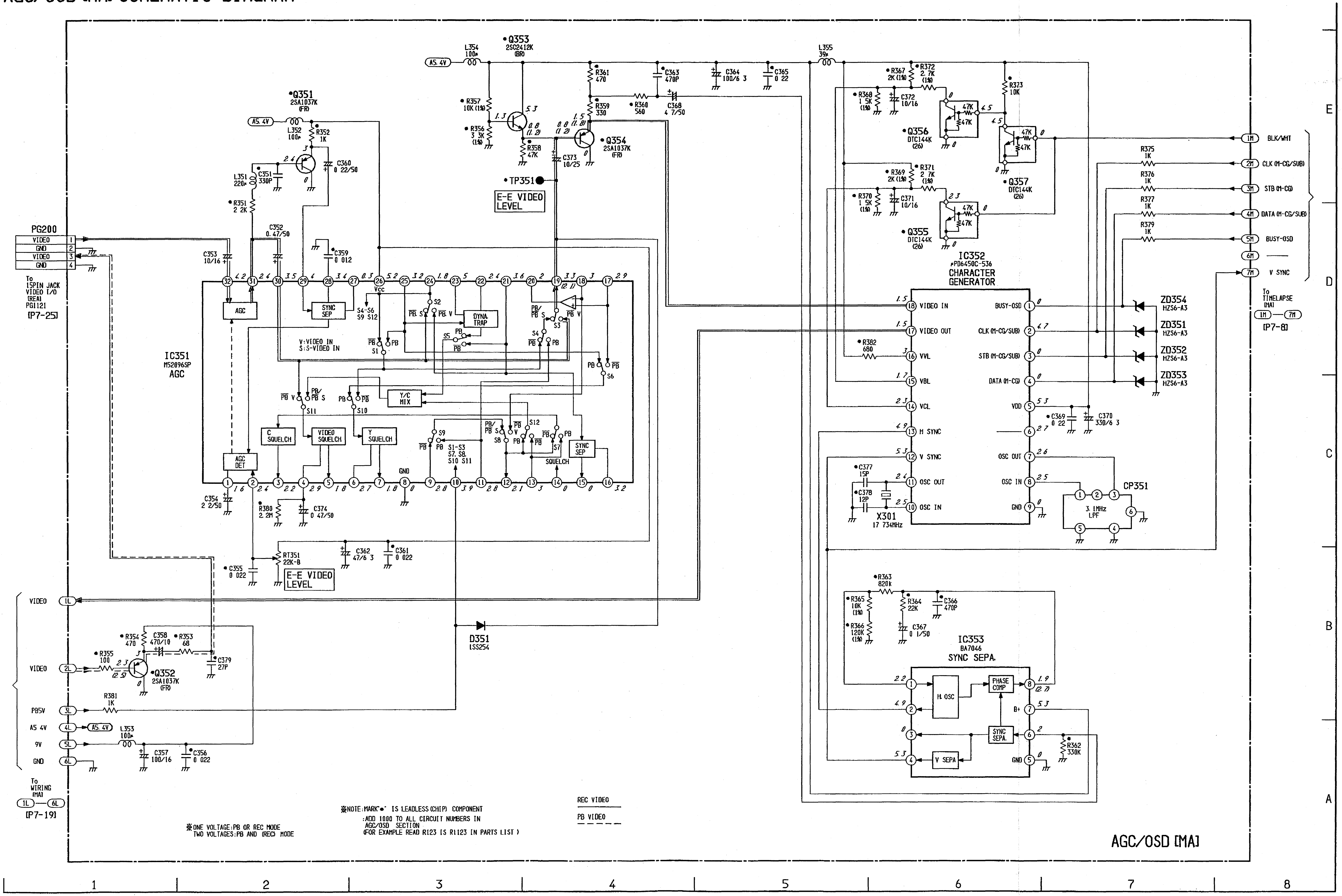
NOTE:ADD 1000 TO ALL CIRCUIT NUMBERS IN
AUDIO SECTION
(FOR EXAMPLE READ R416 IS R1416 IN PARTS LIST)

※NOTE:MARK ■ IS DISCRETE COMPONENT
ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE

REC AUDIO ———

PB AUDIO – – –

AGC/OSD [MA] SCHEMATIC DIAGRAM

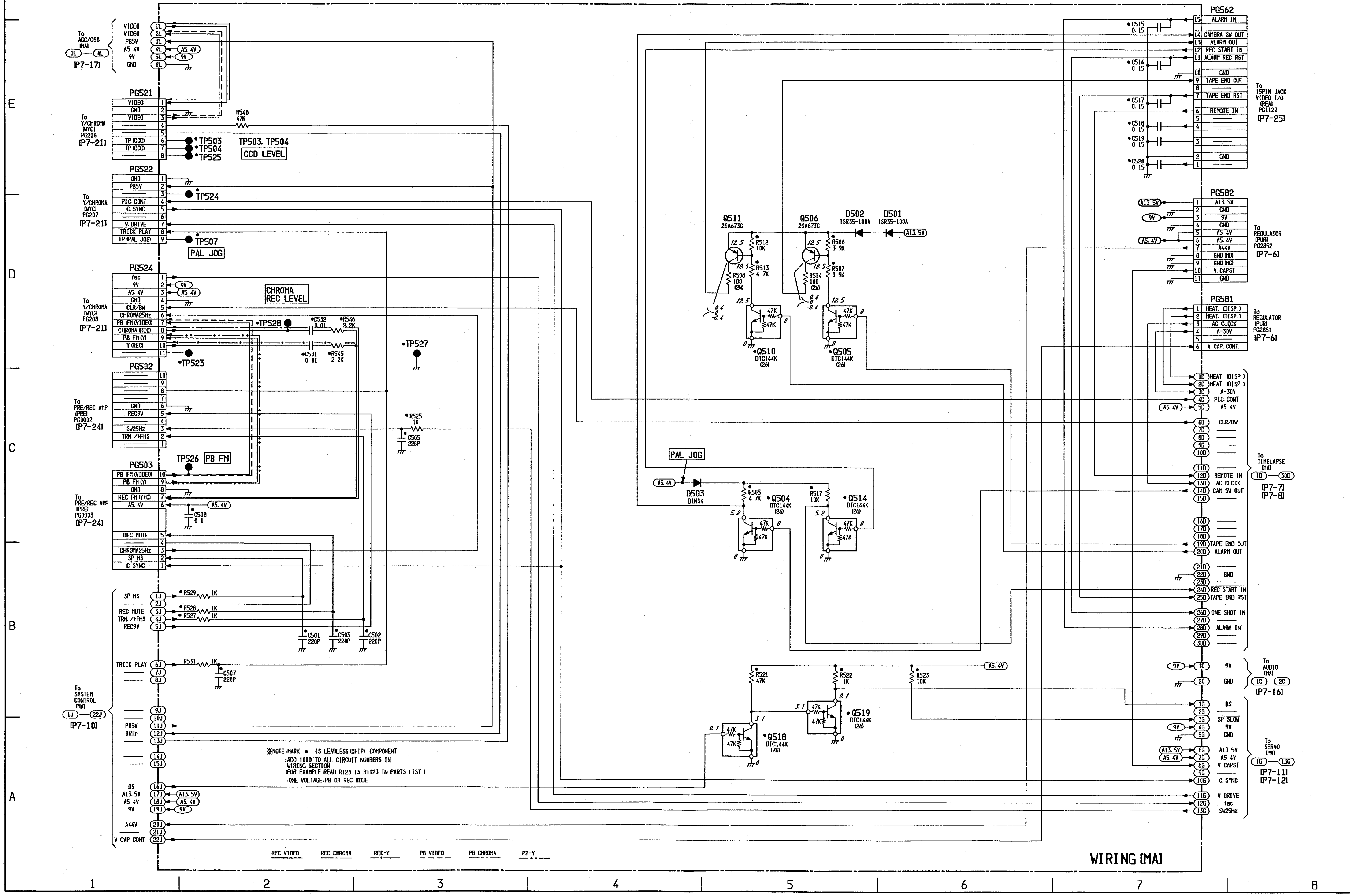


PG200
VIDEO
GND
VIDEO
GND
To 15PIN JACK VIDEO I/O (REA) PG1121 [P7-25]
Q351 2SA1037K (FR)
L352 100μ
R352 1K
C360 0.22/50
L351 220μ
C351 330P
R351 2.2K
C352 0.47/50
C353 10/16
C359 0.012
Q353 2SC2412K (BR)
L354 100μ
A5.4V
R357 10K (1%)
R356 3.3K (1%)
R358 47K
R361 470
R359 330
R360 560
C368 4.7/50
C363 470P
C364 100/6.3
C365 0.22
C373 10/25
Q354 2SA1037K (FR)
TP351
E-E VIDEO LEVEL
L355 39μ
R367 2K (1%)
R372 2.7K (1%)
R373 10K
R368 1.5K (1%)
C372 10/16
Q356 DTC144K (26)
Q357 DTC144K (26)
R369 2K (1%)
R371 2.7K (1%)
R370 1.5K (1%)
C371 10/16
Q355 DTC144K (26)
47K
IC351 M52096SP AGC
AGC
SYNC SEP
DYNA. TRAP
Y/C MIX
C SQUELCH
VIDEO SQUELCH
Y SQUELCH
AGC DET
SYNC SEP
SQUELCH
V:VIDEO IN
S:S-VIDEO IN
S1–S3 S7, S8, S10 S11
GND
Vcc
C354 2.2/50
R380 2.2M
C374 0.47/50
C355 0.022
RT351 22K-B
E-E VIDEO LEVEL
C362 47/6.3
C361 0.022
IC352 μPD6450C-536 CHARACTER GENERATOR
VIDEO IN
VIDEO OUT
VVL
VBL
VCL
H SYNC
V SYNC
OSC OUT
OSC IN
BUSY-OSD
CLK (M-CG/SUB)
STB (M-CG/SUB)
DATA (M-CG)
VDD
GND
R382 680
C377 15P
C378 12P
X301 17.734MHz
C369 0.22
C370 330/6.3
CP351 3.1MHz LPF
ZD354 HZS6-A3
ZD351 HZS6-A3
ZD352 HZS6-A3
ZD353 HZS6-A3
R375 1K
R376 1K
R377 1K
R379 1K
1M BLK/WHT
2M CLK (M-CG/SUB)
3M STB (M-CG)
4M DATA (M-CG/SUB)
5M BUSY-OSD
6M
7M V SYNC
To TIMELAPSE (MA) 1M—7M [P7-8]
IC353 BA7046 SYNC SEPA.
H OSC
PHASE COMP
SYNC SEPA.
V SEPA
B+
R363 820K
R365 10K (1%)
R366 120K (1%)
R364 22K
C366 470P
C367 0.1/50
R362 330K
D351 1SS254
VIDEO 1L
VIDEO 2L
PB5V 3L
A5.4V 4L
9V 5L
GND 6L
R354 470
C358 470/10
R353 68
R355 100
C379 27P
Q352 2SA1037K (FR)
R381 1K
L353 100μ
C357 100/16
C356 0.022
To WIRING (MA) 1L—6L [P7-19]
REC VIDEO
PB VIDEO
AGC/OSD [MA]
1 2 3 4 5 6 7 8
E D C B A

※NOTE: MARK "●" IS LEADLESS (CHIP) COMPONENT
:ADD 1000 TO ALL CIRCUIT NUMBERS IN AGC/OSD SECTION
(FOR EXAMPLE READ R123 IS R1123 IN PARTS LIST)

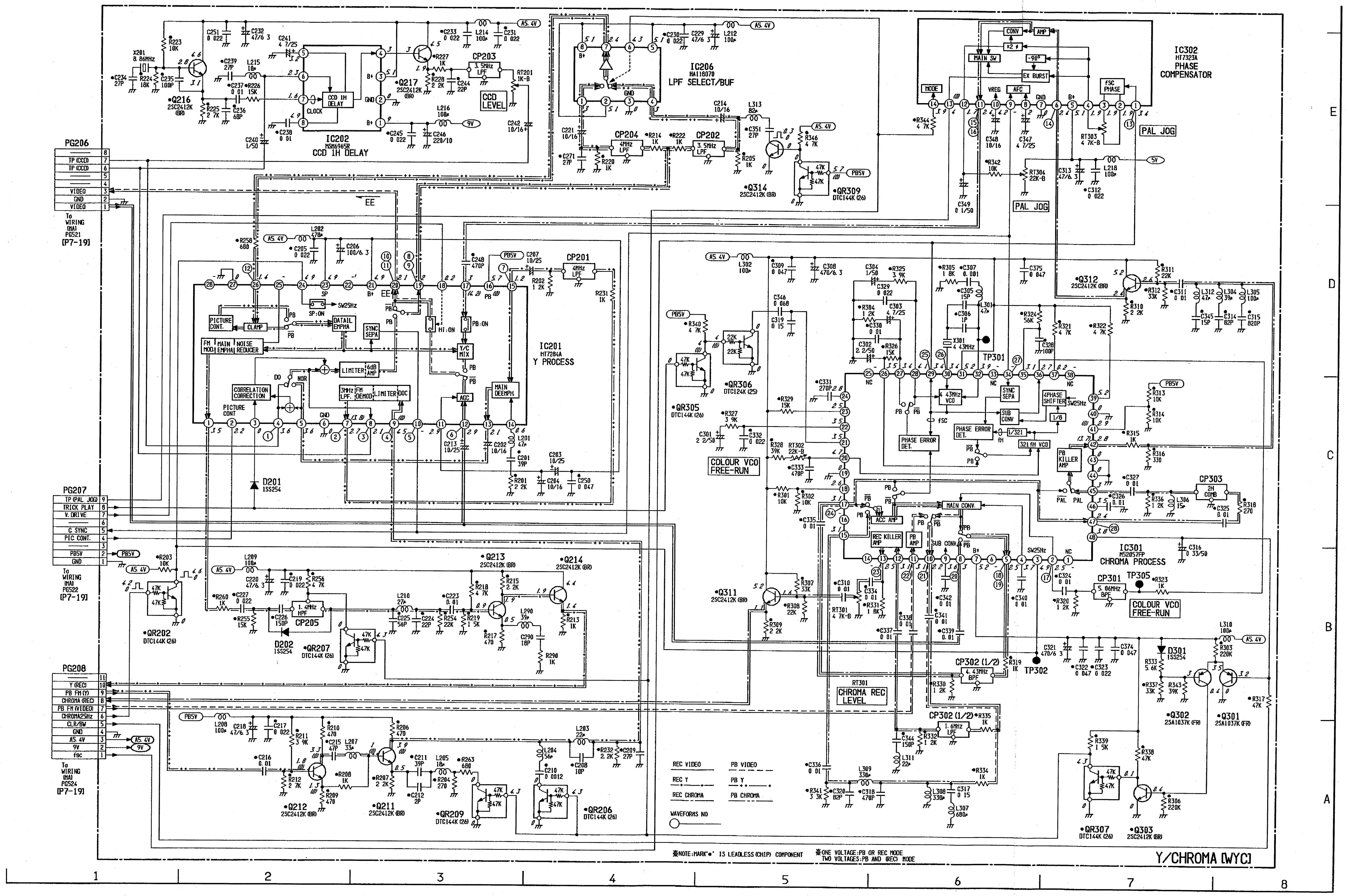
※ONE VOLTAGE: PB OR REC MODE
TWO VOLTAGES: PB AND (REC) MODE

WIRING [MA] SCHEMATIC DIAGRAM

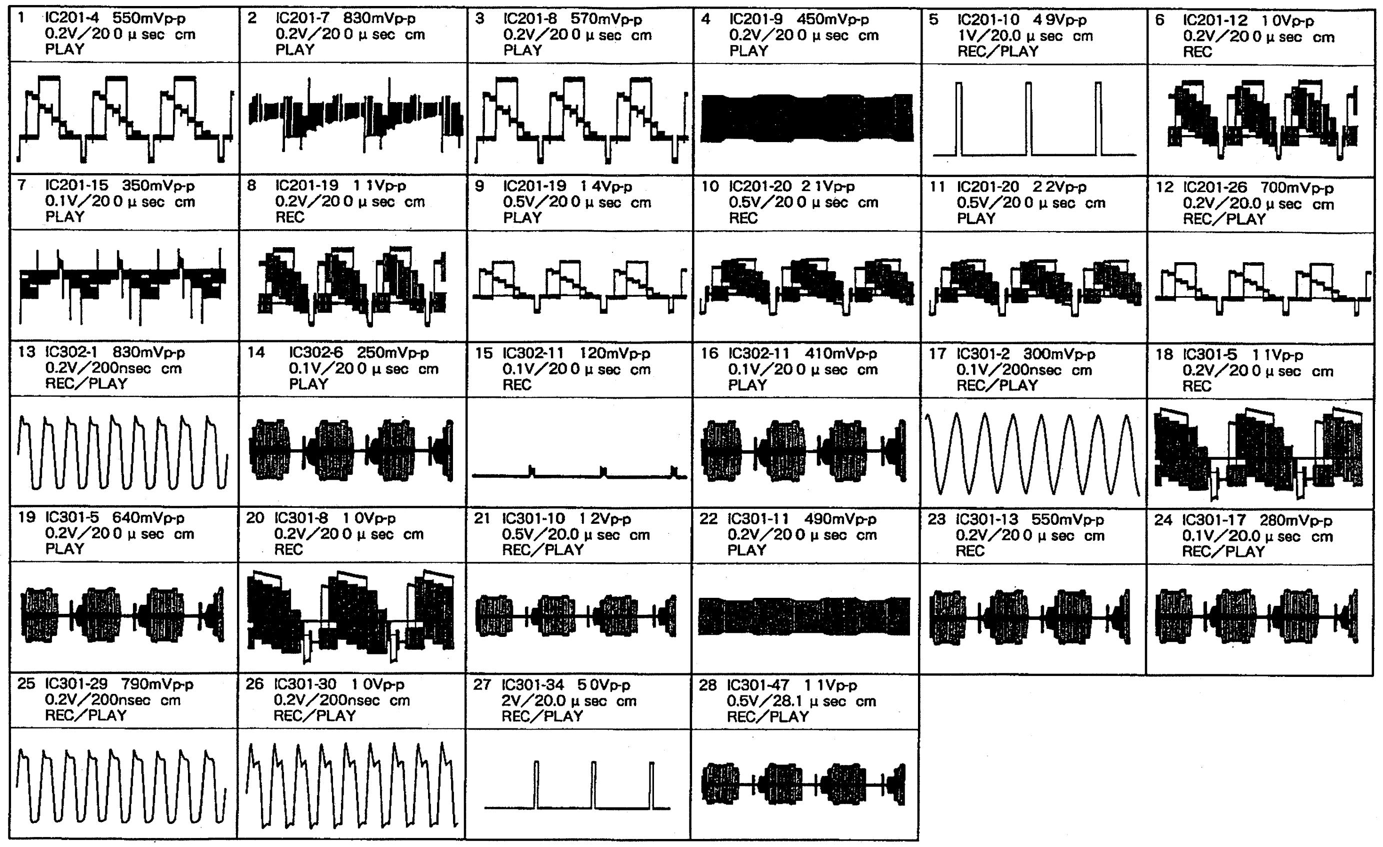

To AGC/OSD [MA] 1L—6L [P7-17]
VIDEO 1L
VIDEO 2L
PB5V 3L
A5.4V 4L
9V 5L
GND 6L
PG521
To Y/CHROMA [MYC] PG206 [P7-21]
VIDEO 1
GND 2
VIDEO 3
TP (CCD) 6
TP (CCD) 7
R548 47K
TP503
TP504
TP525
TP503, TP504
CCD LEVEL
PG522
To Y/CHROMA [MYC] PG207 [P7-21]
GND 1
PB5V 2
PIC. CONT. 4
C. SYNC 5
9V 6
V. DRIVE 7
TRICK PLAY 8
TP (PAL JOG) 9
TP524
TP507
PAL JOG
PG524
To Y/CHROMA [MYC] PG208 [P7-21]
fsc 1
9V 2
A5.4V 3
GND 4
CLR/BW 5
CHROMA25Hz 6
PB FM (VIDEO) 7
CHROMA (REC) 8
PB FM (Y) 9
Y (REC) 10
TP528
TP523
C532 0.01
R546 2.2K
C531 0.01
R545 2.2K
CHROMA REC LEVEL
TP527
PG502
To PRE/REC AMP [PRE] PG0002 [P7-24]
GND 6
REC9V 5
SW25Hz 3
TRN./+FHS 2
R525 1K
C505 220P
TP526
PB FM
PG503
To PRE/REC AMP [PRE] PG0003 [P7-24]
PB FM (VIDEO) 10
PB FM (Y) 9
GND 8
REC FM (Y+C) 7
A5.4V 6
C508 0.1
REC MUTE 5
CHROMA25Hz 3
SP HS 2
C. SYNC 1
To SYSTEM CONTROL [MA] 1J—22J [P7-10]
SP HS 1J
REC MUTE 3J
TRN./+FHS 4J
REC9V 5J
R529 1K
R528 1K
R527 1K
C501 220P
C503 220P
C502 220P
TRICK PLAY 6J
R531 1K
C507 220P
PB5V 11J
06Hr 12J
DS 16J
A13.5V 17J
A5.4V 18J
9V 19J
A44V 20J
V CAP CONT 22J
Q511 2SA673C
Q506 2SA673C
D502 1SR35-100A
D501 1SR35-100A
R512 10K
R513 4.7K
R508 100 (2W)
R506 3.9K
R507 3.9K
R514 100 (2W)
Q510 DTC144K (26)
Q505 DTC144K (26)
12.5
PAL JOG
D503 DIN54
R505 4.7K
Q504 DTC144K (26)
R517 10K
Q514 DTC144K (26)
5.2
R521 47K
R522 1K
R523 10K
Q519 DTC144K (26)
Q518 DTC144K (26)
3.1
0.1
PG562
To 15PIN JACK VIDEO I/O [REA] PG1122 [P7-25]
C515 0.15
ALARM IN 15
CAMERA SW OUT 14
ALARM OUT 13
REC START IN 12
ALARM REC RST 11
C516 0.15
GND 10
TAPE END OUT 9
TAPE END RST 7
C517 0.15
REMOTE IN 6
C518 0.15
C519 0.15
C520 0.15
GND 2
PG582
To REGULATOR [PUR] PG2852 [P7-6]
A13.5V 1
GND 2
9V 3
GND 4
A5.4V 5
A5.4V 6
A44V 7
GND (MD) 8
GND (MC) 9
V. CAPST 10
GND 11
PG581
To REGULATOR [PUR] PG2851 [P7-6]
HEAT. (DISP.) 1
HEAT. (DISP.) 2
AC CLOCK 3
A-30V 4
V. CAP. CONT. 6
To TIMELAPSE [MA] 1D—30D [P7-7] [P7-8]
HEAT (DISP.) 1D
HEAT (DISP.) 2D
A-30V 3D
PIC CONT 4D
A5.4V 5D
CLR/BW 6D
REMOTE IN 12D
AC CLOCK 13D
CAM SW OUT 14D
TAPE END OUT 19D
ALARM OUT 20D
GND 22D
REC START IN 24D
TAPE END RST 25D
ONE SHOT IN 26D
ALARM IN 28D
To AUDIO [MA] 1C—2C [P7-16]
9V 1C
GND 2C
To SERVO [MA] 1G—13G [P7-11] [P7-12]
DS 1G
SP SLOW 3G
9V 4G
GND 5G
A13.5V 6G
A5.4V 7G
V CAPST 8G
C SYNC 10G
V DRIVE 11G
fsc 12G
SW25Hz 13G
REC VIDEO
REC CHROMA
REC-Y
PB VIDEO
PB CHROMA
PB-Y
WIRING [MA]
E
D
C
B
A
1
2
3
4
5
6
7
8

※NOTE:MARK ● IS LEADLESS (CHIP) COMPONENT
:ADD 1000 TO ALL CIRCUIT NUMBERS IN WIRING SECTION
(FOR EXAMPLE READ R123 IS R1123 IN PARTS LIST)
:ONE VOLTAGE:PB OR REC MODE

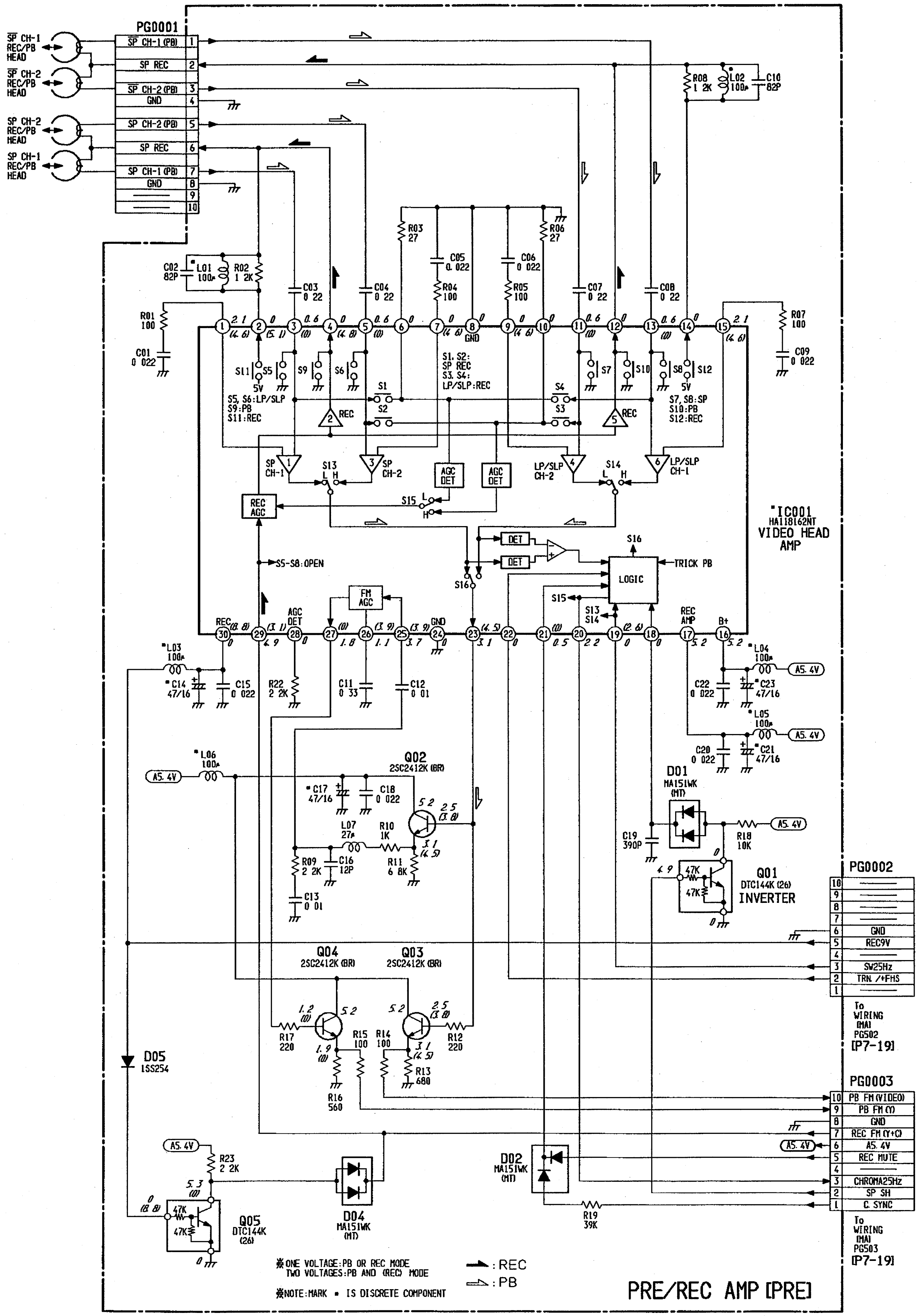
Y/CHROMA [WYC] SCHEMATIC DIAGRAM


IC202 MSM6965R CCD 1H DELAY
CCD 1H DELAY
CLOCK
CP203 3.5MHz LPF
CCD LEVEL
RT201 1K-B
Q216 2SC2412K (BR)
Q217 2SC2412K (BR)
X201 8.86MHz
IC206 HA118070 LPF SELECT/BUF
CP204 4MHz LPF
CP202 3.5MHz LPF
Q314 2SC2412K (BR)
QR309 DTC144K (26)
IC302 HT7323A PHASE COMPENSATOR
MODE
MAIN SW
CONV
AMP
x2 f
-90°
EX BURST
AFC
VREG
fSC PHASE
PAL JOG
RT303 4.7K-B
RT304 22K-B
PG206
TP (CCD)
VIDEO
GND
To WIRING (MA) PG521 [P7-19]
EE
IC201 HT7284A Y PROCESS
CP201 4MHz LPF
PICTURE CONT.
CLAMP
DATAIL EMPHA
SYNC SEPA
FM MOD
MAIN EMPHA
NOISE REDUCER
Y/C MIX
LIMITER
6dB AMP
CORRELATION CORRECTION
PICTURE CONT
3MHz LPF
FM DEMOD
LIMITER
DOC
AGC
MAIN DEEMPH.
SP:ON
SW25Hz
HI:ON
PB:ON
D201 1SS254
PG207
TP (PAL JOG)
TRICK PLAY
V. DRIVE
C SYNC
PIC CONT.
PB5V
To WIRING (MA) PG522 [P7-19]
QR202 DTC144K (26)
Q213 2SC2412K (BR)
Q214 2SC2412K (BR)
CP205 1.4MHz HPF
D202 1SS254
QR207 DTC144K (26)
PG208
Y (REC)
PB FM (Y)
CHROMA (REC)
PB FM (VIDEO)
CHROMA25Hz
CLR/BW
A5.4V
9V
fsc
To WIRING (MA) PG524 [P7-19]
Q212 2SC2412K (BR)
Q211 2SC2412K (BR)
QR209 DTC144K (26)
QR206 DTC144K (26)
QR306 DTC124K (25)
QR305 DTC144K (26)
COLOUR VCO FREE-RUN
Q311 2SC2412K (BR)
Q312 2SC2412K (BR)
X301 4.43MHz
TP301
4.43MHz VCO
SYNC SEPA
SUB CONV
PHASE ERROR DET.
1/321
321 fH VCO
4PHASE SHIFTER
1/8
PB KILLER AMP
ACC AMP
REC KILLER AMP
PB AMP
MAIN CONV.
SUB CONV
CP303 2H COMB
IC301 M52057FP CHROMA PROCESS
CP301 5.06MHz BPF
TP305
COLOUR VCO FREE-RUN
RT301 4.7K-B
CP302 (1/2) 4.43MHz BPF
TP302
RT301 CHROMA REC LEVEL
CP302 (1/2) 1.6MHz LPF
D301 1SS254
Q302 2SA1037K (FR)
Q301 2SA1037K (FR)
QR307 DTC144K (26)
Q303 2SC2412K (BR)
REC VIDEO
PB VIDEO
REC Y
PB Y
REC CHROMA
PB CHROMA
WAVEFORMS NO
※NOTE:MARK"●" IS LEADLESS(CHIP) COMPONENT
※ONE VOLTAGE:PB OR REC MODE TWO VOLTAGES:PB AND (REC) MODE
Y/CHROMA [WYC]
A
B
C
D
E
1
2
3
4
5
6
7
8

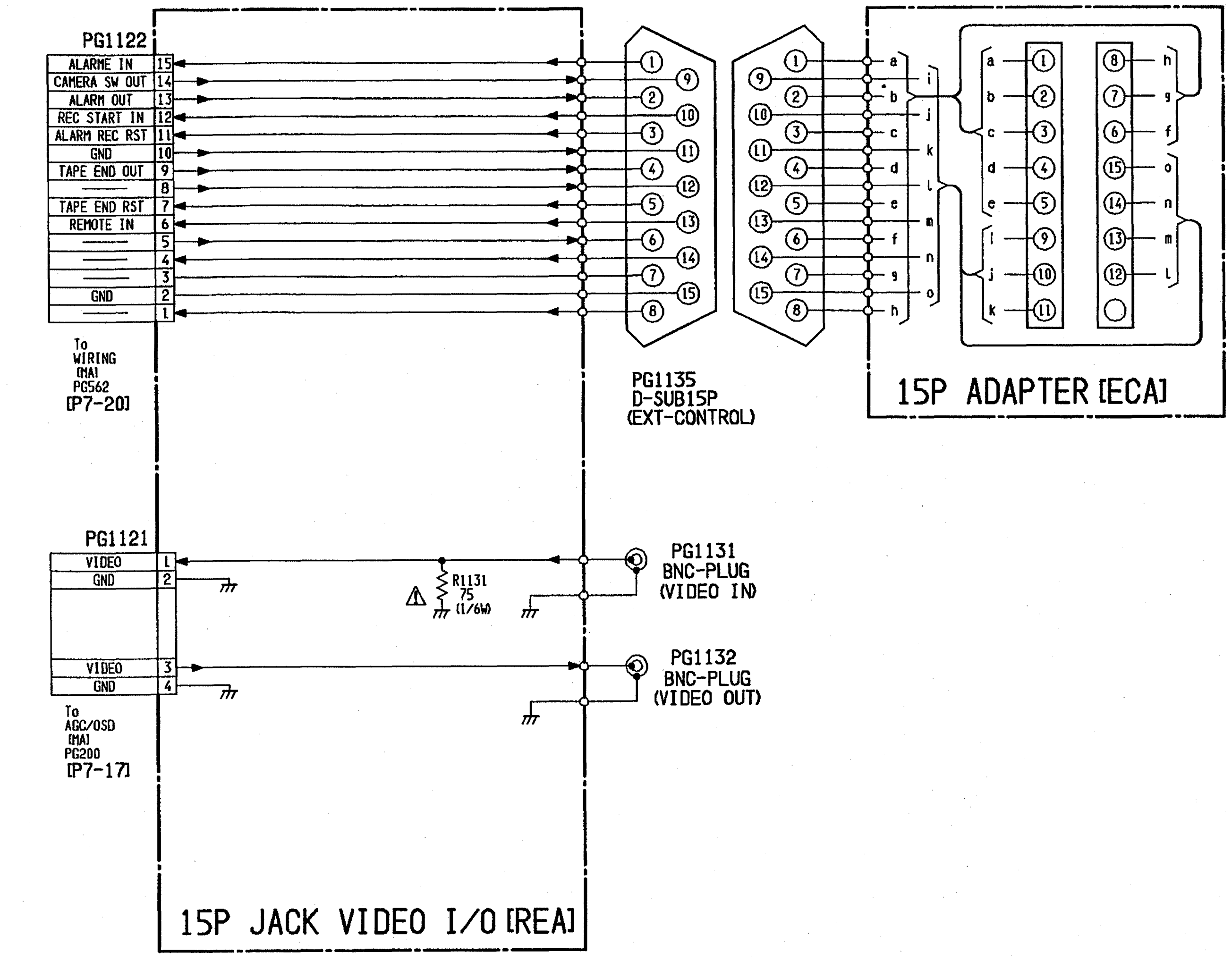
Y/CHROMA WAVEFORMS



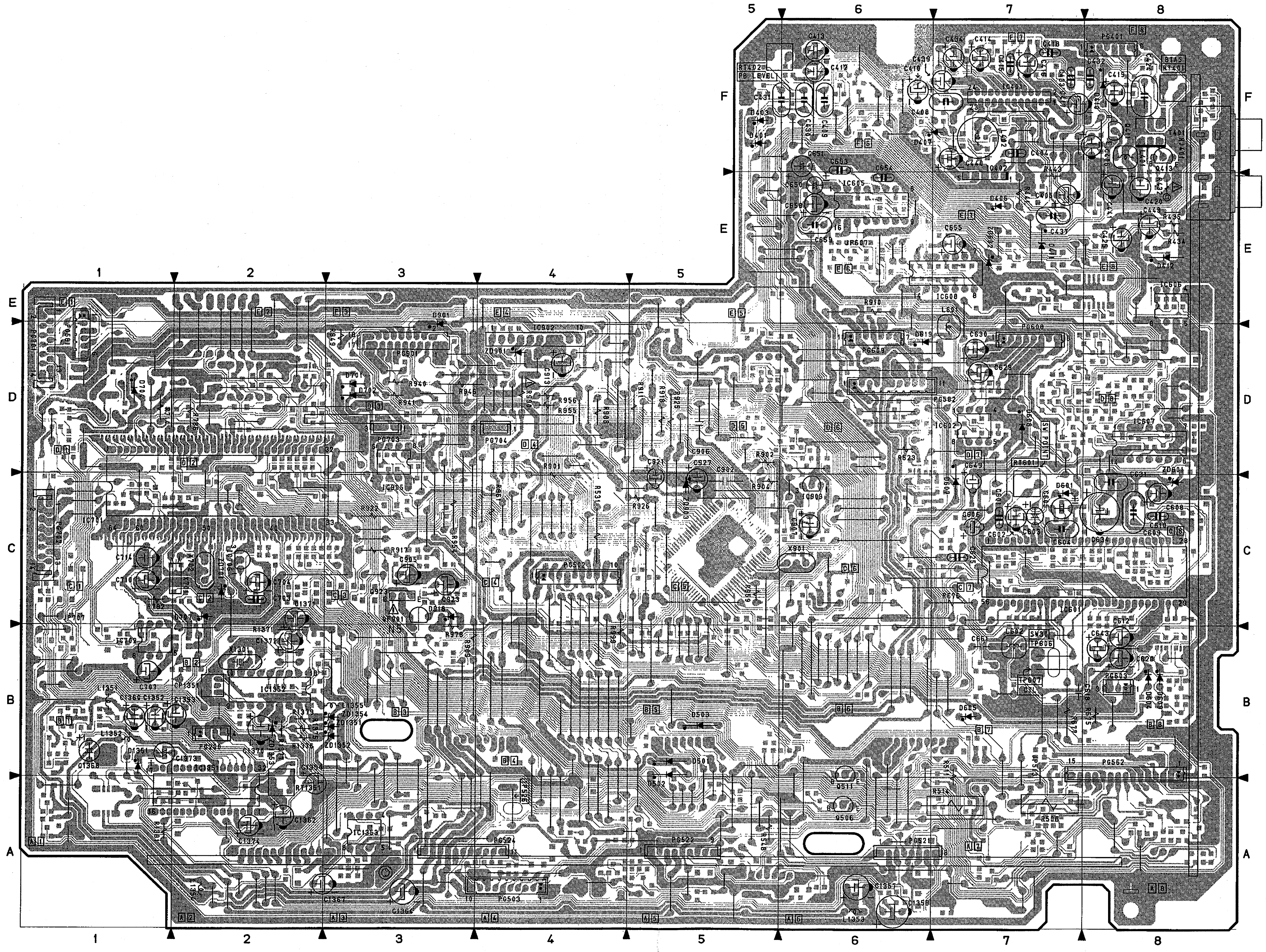
PRE/REC AMP [PRE] SCHEMATIC DIAGRAM


PG0001
S̅P̅ CH-1 REC/PB HEAD
S̅P̅ CH-2 REC/PB HEAD
SP CH-2 REC/PB HEAD
SP CH-1 REC/PB HEAD
S̅P̅ CH-1 (PB) 1
SP REC 2
S̅P̅ CH-2 (PB) 3
GND 4
SP CH-2 (PB) 5
SP REC 6
SP CH-1 (PB) 7
GND 8
9
10
C02 82P
L01 100µ
R02 1 2K
R01 100
C01 0 022
R03 27
R06 27
C03 0 22
C04 0 22
C05 0 022
C06 0 022
R04 100
R05 100
C07 0 22
C08 0 22
R07 100
C09 0 022
R08 1 2K
L02 100µ
C10 82P
S1, S2: SP REC
S3, S4: LP/SLP:REC
S5, S6:LP/SLP
S9:PB
S11:REC
S7, S8:SP
S10:PB
S12:REC
SP CH-1
SP CH-2
LP/SLP CH-2
LP/SLP CH-1
AGC DET
REC AGC
S5-S8:OPEN
DET
LOGIC
TRICK PB
FM AGC
*IC001
HA118162NT
VIDEO HEAD AMP
REC AMP
B+
GND
L03 100µ
C14 47/16
C15 0 022
R22 2 2K
C11 0 33
C12 0 01
L04 100µ
C22 0 022
C23 47/16
L05 100µ
C20 0 022
C21 47/16
A5. 4V
L06 100µ
Q02 2SC2412K (BR)
C17 47/16
C18 0 022
L07 27µ
R10 1K
R09 2 2K
C16 12P
R11 6 8K
C13 0 01
D01 MA151WK (MT)
C19 390P
R18 10K
Q01 DTC144K (26) INVERTER
Q04 2SC2412K (BR)
Q03 2SC2412K (BR)
R17 220
R15 100
R14 100
R12 220
R16 560
R13 680
D05 1SS254
R23 2 2K
Q05 DTC144K (26)
D04 MA151WK (MT)
D02 MA151WK (MT)
R19 39K
PG0002
10
9
8
7
6 GND
5 REC9V
4
3 SW25Hz
2 TRN /+FHS
1
To WIRING [MA] PG502 [P7-19]
PG0003
10 PB FM (VIDEO)
9 PB FM (Y)
8 GND
7 REC FM (Y+C)
6 A5. 4V
5 REC MUTE
4
3 CHROMA25Hz
2 SP SH
1 C. SYNC
To WIRING [MA] PG503 [P7-19]
※ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE
※NOTE:MARK ▪ IS DISCRETE COMPONENT
➡ : REC
⇨ : PB
PRE/REC AMP [PRE]

15P JACK·VIDEO I/O [REA]. 15P ADAPTER [ECA] SCHEMATIC DIAGRAMS


PG1122
ALARME IN 15
CAMERA SW OUT 14
ALARM OUT 13
REC START IN 12
ALARM REC RST 11
GND 10
TAPE END OUT 9
8
TAPE END RST 7
REMOTE IN 6
5
4
3
GND 2
1
To WIRING [MA] PG562 [P7-20]
PG1135 D-SUB15P (EXT-CONTROL)
15P ADAPTER [ECA]
PG1121
VIDEO 1
GND 2
VIDEO 3
GND 4
To AGC/OSD [MA] PG200 [P7-17]
R1131 75 (1/6W)
PG1131 BNC-PLUG (VIDEO IN)
PG1132 BNC-PLUG (VIDEO OUT)
15P JACK VIDEO I/O [REA]

MA CIRCUIT BOARD [SIDE A]


1
2
3
4
5
6
7
8
A
B
C
D
E
F
RT402 PB LEVEL
IC791
IC602
IC603
IC606
IC607
IC608
IC1352
IC1353
X901
SW301
SW POINT

MA(MAIN)-SIDE A-
[PATTERN No.JA1149-6]

IDENTIFICATION OF PARTS LOCATION

MA [MAS]

Symbol No	Parts Location
C	
C0404	A-7F
C0405	A-7E
C0406	A-8F
C0408	A-7F
C0409	A-6F
C0410	A-6F
C0411	B-6F
C0412	A-6F
C0413	A-6F
C0414	A-7F
C0415	A-7F
C0416	A-7F
C0417	A-7F
C0418	A-7F
C0419	A-8F
C0420	A-8E
C0421	B-8F
C0422	B-8E
C0423	B-8F
C0424	A-8F
C0425	A-8E
C0426	B-8F
C0430	A-6F
C0431	A-5F
C0432	A-8F
C0433	A-7F
C0434	A-7F
C0437	A-7E
C0439	A-7F
C0440	A-7F
C0441	A-8E
C0442	B-8F
C0443	A-8E
C0501	B-5A
C0502	B-4C
C0503	B-4A
C0505	B-4C
C0507	B-5A
C0508	B-3A
C0515	B-7A
C0516	B-7A
C0517	B-7B
C0518	B-8B
C0519	B-8B
C0520	B-8B
C0531	B-4A
C0532	B-4A
C0601	A-7C
C0602	A-7C
C0603	A-7C
C0604	A-7C
C0605	A-7C
C0606	A-7C
C0608	A-8C
C0609	A-8C
C0610	A-8C

Symbol No	Parts Location
C0611	B-8C
C0612	A-8B
C0613	B-6E
C0614	B-8D
C0618	A-7B
C0619	B-7C
C0620	A-8B
C0622	B-7C
C0623	B-7C
C0624	B-7C
C0625	A-7C
C0627	B-7D
C0628	B-7D
C0629	A-7D
C0630	A-7D
C0631	A-8C
C0632	B-7D
C0633	B-7D
C0634	A-8C
C0635	B-7D
C0642	B-8C
C0643	A-8B
C0644	B-8C
C0645	B-8C
C0649	A-7C
C0650	A-6E
C0651	A-6F
C0652	B-6E
C0653	A-6F
C0654	A-6E
C0655	A-7E
C0656	B-8E
C0657	B-8E
C0658	A-6E
C0659	A-6E
C0661	A-7B
C0663	B-7E
C0703	A-2C
C0704	A-2C
C0706	B-1B
C0707	A-1B
C0708	B-1C
C0709	B-2C
C0710	A-1C
C0711	B-1C
C0712	B-2C
C0713	B-2C
C0714	A-1C
C0715	B-1C
C0902	A-5C
C0903	B-6D
C0905	A-3C
C0906	A-5D
C0907	A-6C
C0909	B-3D
C0910	B-3D
C0911	B-4D

Symbol No	Parts Location
C0913	A-4D
C0914	B-4D
C0916	B-4D
C0917	B-4D
C0918	B-6C
C0919	B-6C
C0921	A-5C
C0922	B-6C
C0923	A-3C
C0927	A-5C
C0928	B-6D
C0954	B-5C
C1351	B-1B
C1352	A-1B
C1353	A-2B
C1354	A-2A
C1355	B-2B
C1356	B-6A
C1357	A-6A
C1358	A-6A
C1359	B-1B
C1360	A-1B
C1361	B-2A
C1362	A-2A
C1363	B-1B
C1364	A-3A
C1365	B-3A
C1366	B-3A
C1367	A-2A
C1368	A-1B
C1369	B-2B
C1370	A-2B
C1371	A-2C
C1372	A-2B
C1373	A-1B
C1374	A-2A
C1377	B-2B
C1378	B-2B
C1379	B-2B
CP	
CP1351	A-2B
D	
D0401	A-5F
D0403	A-5F
D0405	B-6F
D0406	A-7E
D0407	A-7F
D0410	A-8F
D0411	A-7E
D0412	A-8E
D0501	A-5B
D0502	A-5B
D0503	A-5B
D0601	A-7C
D0604	A-8B
D0605	A-7B
D0607	A-7C

Symbol No	Parts Location
D0608	A-7D
D0609	A-8B
D0612	B-8D
D0614	B-7E
D0619	A-6D
D0701	A-3D
D0702	A-3D
D0704	A-1D
D0707	A-2C
D0901	A-3D
D0918	A-3C
D1351	A-1B
IC	
IC0401	A-7F
IC0402	A-7E
IC0601	A-8C
IC0602	A-7D
IC0605	A-6E
IC0606	A-8E
IC0607	A-8D
IC0608	A-7E
IC0609	B-6D
IC0612	B-8B
IC0613	B-8B
IC0701	A-2C
IC0702	A-1B
IC0706	A-2C
IC0901	B-5C
IC0902	A-4D
IC0903	A-6C
IC0905	A-3D
IC1351	A-2A
IC1352	A-2B
IC1353	A-3A
L	
L0401	A-8F
L0402	A-7F
L0601	A-7D
L0602	A-7B
L1351	A-1B
L1352	A-1B
L1353	A-6A
L1354	A-2A
L1355	A-3B
PG	
PG0200	A-2B
PG0401	A-8F
PG0502	A-4C
PG0503	A-4A
PG0521	A-6A
PG0522	A-5A
PG0524	A-3A
PG0562	A-8B
PG0581	A-1D
PG0582	A-6D
PG0603	A-8B
PG0608	A-7D

Symbol No.	Parts Location
PG0609	A-6D
PG0701	A-1D
PG0702	A-1C
PG0703	A-3D
PG0704	A-4D
PG0901	A-3D
Q	
Q0403	B-8E
Q0407	B-6F
Q0408	B-6F
Q0411	A-8F
Q0412	B-8F
Q0413	A-8F
Q0414	B-8E
Q0415	B-5F
Q0416	B-5F
Q0417	B-7F
Q0418	B-7F
Q0419	B-7F
Q0420	B-6F
Q0421	B-6F
Q0422	B-8F
Q0424	B-7E
Q0425	B-8E
Q0504	B-7A
Q0505	B-7A
Q0506	A-6A
Q0510	B-5B
Q0511	A-6B
Q0514	B-7A
Q0518	B-7C
Q0519	B-6C
Q0603	B-8B
Q0604	B-8B
Q0605	B-8B
Q0607	B-8D
Q0609	B-8D
Q0611	B-8D
Q0618	B-7D
Q0619	B-7B
Q0623	B-8D
Q0624	B-6E
Q0626	B-6E
Q0637	B-5D
Q0702	B-2C
Q0901	B-3C
Q0902	B-3C
Q0903	B-6D
Q0904	B-3C
Q0905	B-5D
Q0906	B-6D
Q0913	B-4A
Q0914	B-4A
Q0919	B-6D
Q0923	A-3C
Q0924	B-3C
Q0925	B-6C

Symbol No	Parts Location
Q0931	B-7C
Q1351	B-1B
Q1352	B-6A
Q1353	B-1B
Q1354	B-1B
Q1355	B-2B
Q1356	B-2B
Q1357	B-3B
QF	
QF0901	A-3C
R	
R0402	B-8F
R0403	B-8F
R0405	B-7F
R0406	B-6F
R0407	B-7F
R0408	B-7F
R0409	B-7F
R0410	B-7F
R0411	B-7E
R0413	B-7F
R0414	B-6F
R0415	B-6F
R0416	B-7F
R0417	B-6F
R0418	B-8E
R0419	B-6F
R0420	B-7F
R0422	B-7F
R0423	B-7F
R0424	B-7F
R0425	B-7F
R0426	B-7F
R0427	B-8F
R0428	B-8F
R0429	B-8F
R0430	B-8F
R0431	B-8E
R0432	A-8E
R0433	B-8E
R0434	A-8E
R0435	A-8E
R0436	B-8E
R0439	B-7F
R0441	A-7E
R0443	A-7E
R0444	B-7E
R0445	B-7F
R0446	B-7F
R0447	B-7F
R0505	B-7A
R0506	B-6A
R0507	B-6A
R0508	A-7A
R0512	B-5B
R0513	B-6B
R0514	A-7A

Symbol No	Parts Location
R0517	B-7A
R0521	B-6C
R0522	B-6C
R0523	A-6D
R0525	B-4C
R0527	B-4C
R0528	B-4A
R0529	B-4A
R0531	A-4C
R0545	B-4A
R0546	B-4A
R0548	A-5A
R0601	B-7C
R0602	B-7C
R0603	B-7C
R0604	B-7C
R0605	B-8C
R0606	B-7C
R0607	B-8C
R0608	B-7C
R0609	B-8C
R0610	B-8C
R0611	B-8C
R0612	B-8C
R0613	B-8C
R0614	B-8C
R0615	B-8C
R0616	B-8C
R0617	B-8C
R0618	B-8C
R0619	B-8C
R0620	B-8C
R0622	B-8D
R0623	B-8D
R0624	B-8D
R0625	B-8D
R0626	B-8D
R0627	B-8D
R0630	B-8B
R0632	B-7C
R0635	B-7C
R0636	B-8C
R0637	B-8C
R0638	B-8B
R0639	B-8C
R0640	B-8B
R0641	B-7D
R0642	B-7D
R0643	B-7D
R0644	B-7D
R0645	B-7D
R0646	B-7D
R0647	B-7D
R0648	B-7D
R0649	B-7B
R0651	B-7C
R0652	B-7C

Symbol No	Parts Location
R0654	B-7E
R0663	B-6E
R0664	B-7B
R0665	B-8C
R0666	B-8B
R0668	B-8B
R0669	B-8B
R0670	B-8B
R0671	B-8B
R0672	B-8B
R0673	B-8B
R0674	B-6E
R0675	A-8B
R0676	A-7C
R0677	A-7B
R0678	B-6E
R0679	B-6D
R0680	B-6E
R0681	B-6E
R0682	B-8E
R0683	B-8D
R0684	B-8E
R0685	B-8D
R0686	B-8D
R0688	B-8D
R0690	B-8D
R0696	B-7D
R0697	B-6E
R0699	B-6E
R0701	B-3D
R0705	B-2C
R0706	B-1D
R0707	B-1D
R0708	B-1D
R0709	B-1D
R0710	B-1D
R0711	B-2D
R0712	B-1D
R0713	B-1D
R0714	A-1D
R0715	B-2D
R0719	B-2D
R0720	B-2D
R0722	B-2D
R0723	B-2D
R0724	B-2D
R0726	B-2C
R0728	B-2C
R0729	B-2C
R0730	B-2C
R0732	B-1B
R0733	B-1B
R0734	B-1B
R0735	B-1C
R0736	B-1C
R0737	B-1C
R0738	B-2B

Symbol No	Parts Location
R0739	B-1C
R0740	B-1C
R0741	B-1C
R0742	B-1C
R0743	B-1C
R0744	B-2C
R0749	B-2C
R0750	B-2C
R0754	B-1C
R0755	B-1C
R0758	B-1C
R0763	B-6E
R0765	B-6E
R0770	B-6E
R0771	B-7E
R0772	B-7E
R0773	B-7E
R0780	B-1B
R0781	B-2B
R0782	A-1C
R0783	B-2C
R0786	A-2D
R0788	B-2D
R0789	B-3C
R0790	B-2C
R0796	B-2C
R0901	A-4C
R0902	A-5D
R0904	A-5C
R0905	B-7C
R0906	B-6C
R0909	A-3B
R0910	A-6E
R0911	A-5D
R0912	B-5D
R0913	B-3C
R0914	B-3C
R0915	B-3C
R0916	B-3C
R0917	A-3C
R0918	A-5D
R0920	B-6C
R0921	B-6C
R0922	A-3C
R0923	B-3C
R0924	B-6B
R0925	A-5D
R0926	A-5C
R0928	B-3D
R0934	B-4B
R0935	B-5B
R0936	B-3D
R0937	B-3D
R0938	B-3D
R0940	A-3D
R0941	A-3D
R0942	B-3D

Symbol No	Parts Location
R0943	B-3D
R0944	B-3D
R0945	B-4D
R0946	A-3D
R0947	B-3D
R0948	B-3D
R0949	A-3D
R0950	B-5C
R0953	B-5B
R0954	A-3C
R0955	A-4D
R0956	A-4D
R0957	B-3D
R0958	B-6C
R0959	A-5C
R0960	B-3C
R0961	A-4C
R0962	B-5B
R0963	B-5B
R0964	B-5B
R0966	B-5D
R0969	B-4B
R0970	B-5C
R0975	B-6D
R0978	A-3B
R0979	B-3C
R0980	B-3B
R0988	A-4D
R0990	A-4D
R0993	B-3D
R0994	B-3D
R0995	B-3D
R0996	B-3D
R0997	B-3D
R0998	B-3D
R0999	A-4B
R1351	B-1B
R1352	B-1B
R1353	B-2B
R1354	B-6A
R1355	B-6A
R1356	B-1B
R1357	B-1B
R1358	B-1B
R1359	B-1B
R1360	B-1B
R1361	B-1B
R1362	B-3A
R1363	B-3A
R1364	B-3A
R1365	B-3A
R1366	B-3A
R1367	B-2B
R1368	B-2B
R1369	B-2B
R1370	B-2B
R1371	A-2B

Symbol No	Parts Location
R1372	B-2B
R1373	B-2B
R1375	A-2B
R1376	A-2B
R1377	A-2B
R1379	A-2B
R1380	B-2A
R1381	A-1A
R1382	B-2B
RJ	
RJ0401	A-8F
RT	
RT0401	A-8F
RT0402	A-5F
RT0601	A-7C
RT1351	A-2A
T	
T0401	A-8F
TP	
TP0401	B-7F
TP0402	B-7F
TP0503	B-6A
TP0504	B-6A
TP0507	B-5A
TP0523	B-4A
TP0524	B-5A
TP0525	B-6A
TP0526	A-4A
TP0527	B-4C
TP0528	B-4A
TP0604	B-8D
TP0606	A-7B
TP0607	A-7B
TP0608	B-8C
TP0609	B-8C
TP0610	B-8C
TP1351	B-2B
X	
X0701	A-2C
X0702	A-2C
X0901	A-6C
X1301	A-2B
ZD	
ZD0601	A-8C
ZD0602	A-7E
ZD0701	A-2C
ZD0901	A-4D
ZD0903	A-5C
ZD1351	A-3B
ZD1352	A-3B
ZD1353	A-2B
ZD1354	A-3B

IDENTIFICATION OF PARTS LOCATION

MA [MAS]

Symbol No	Parts Location
C	
C0404	A-7F
C0405	A-7E
C0406	A-8F
C0408	A-7F
C0409	A-6F
C0410	A-6F
C0411	B-6F
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C0414	A-7F
C0415	A-7F
C0416	A-7F
C0417	A-7F
C0418	A-7F
C0419	A-8F
C0420	A-8E
C0421	B-8F
C0422	B-8E
C0423	B-8F
C0424	A-8F
C0425	A-8E
C0426	B-8F
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C0431	A-5F
C0432	A-8F
C0433	A-7F
C0434	A-7F
C0437	A-7E
C0439	A-7F
C0440	A-7F
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C0442	B-8F
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C0503	B-4A
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C0516	B-7A
C0517	B-7B
C0518	B-8B
C0519	B-8B
C0520	B-8B
C0531	B-4A
C0532	B-4A
C0601	A-7C
C0602	A-7C
C0603	A-7C
C0604	A-7C
C0605	A-7C
C0606	A-7C
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C0609	A-8C
C0610	A-8C
C0611	B-8C
C0612	A-8B
C0613	B-6E
C0614	B-8D
C0618	A-7B
C0619	B-7C
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C0642	B-8C
C0643	A-8B
C0644	B-8C
C0645	B-8C
C0649	A-7C
C0650	A-6E
C0651	A-6F
C0652	B-6E
C0653	A-6F
C0654	A-6E
C0655	A-7E
C0656	B-8E
C0657	B-8E
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C0713	B-2C
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C1358	A-6A
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C1368	A-1B
C1369	B-2B
C1370	A-2B
C1371	A-2C
C1372	A-2B
C1373	A-1B
C1374	A-2A
C1377	B-2B
C1378	B-2B
C1379	B-2B
CP	
CP1351	A-2B
D	
D0401	A-5F
D0403	A-5F
D0405	B-6F
D0406	A-7E
D0407	A-7F
D0410	A-8F
D0411	A-7E
D0412	A-8E
D0501	A-5B
D0502	A-5B
D0503	A-5B
D0601	A-7C
D0604	A-8B
D0605	A-7B
D0607	A-7C
D0608	A-7D
D0609	A-8B
D0612	B-8D
D0614	B-7E
D0619	A-6D
D0701	A-3D
D0702	A-3D
D0704	A-1D
D0707	A-2C
D0901	A-3D
D0918	A-3C
D1351	A-1B
IC	
IC0401	A-7F
IC0402	A-7E
IC0601	A-8C
IC0602	A-7D
IC0605	A-6E
IC0606	A-8E
IC0607	A-8D
IC0608	A-7E
IC0609	B-6D
IC0612	B-8B
IC0613	B-8B
IC0701	A-2C
IC0702	A-1B
IC0706	A-2C
IC0901	B-5C
IC0902	A-4D
IC0903	A-6C
IC0905	A-3D
IC1351	A-2A
IC1352	A-2B
IC1353	A-3A
L	
L0401	A-8F
L0402	A-7F
L0601	A-7D
L0602	A-7B
L1351	A-1B
L1352	A-1B
L1353	A-6A
L1354	A-2A
L1355	A-3B
PG	
PG0200	A-2B
PG0401	A-8F
PG0502	A-4C
PG0503	A-4A
PG0521	A-6A
PG0522	A-5A
PG0524	A-3A
PG0562	A-8B
PG0581	A-1D
PG0582	A-6D
PG0603	A-8B
PG0608	A-7D
PG0609	A-6D
PG0701	A-1D
PG0702	A-1C
PG0703	A-3D
PG0704	A-4D
PG0901	A-3D
Q	
Q0403	B-8E
Q0407	B-6F
Q0408	B-6F
Q0411	A-8F
Q0412	B-8F
Q0413	A-8F
Q0414	B-8E
Q0415	B-5F
Q0416	B-5F
Q0417	B-7F
Q0418	B-7F
Q0419	B-7F
Q0420	B-6F
Q0421	B-6F
Q0422	B-8F
Q0424	B-7E
Q0425	B-8E
Q0504	B-7A
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Q0506	A-6A
Q0510	B-5B
Q0511	A-6B
Q0514	B-7A
Q0518	B-7C
Q0519	B-6C
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Q0604	B-8B
Q0605	B-8B
Q0607	B-8D
Q0609	B-8D
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Q0618	B-7D
Q0619	B-7B
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Q0903	B-6D
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Q1352	B-6A
Q1353	B-1B
Q1354	B-1B
Q1355	B-2B
Q1356	B-2B
Q1357	B-3B
QF	
QF0901	A-3C
R	
R0402	B-8F
R0403	B-8F
R0405	B-7F
R0406	B-6F
R0407	B-7F
R0408	B-7F
R0409	B-7F
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R0411	B-7E
R0413	B-7F
R0414	B-6F
R0415	B-6F
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R0417	B-6F
R0418	B-8E
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R0420	B-7F
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R0423	B-7F
R0424	B-7F
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R0426	B-7F
R0427	B-8F
R0428	B-8F
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R0431	B-8E
R0432	A-8E
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R0436	B-8E
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R0443	A-7E
R0444	B-7E
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R0447	B-7F
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R0507	B-6A
R0508	A-7A
R0512	B-5B
R0513	B-6B
R0514	A-7A
R0517	B-7A
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R0522	B-6C
R0523	A-6D
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R0527	B-4C
R0528	B-4A
R0529	B-4A
R0531	A-4C
R0545	B-4A
R0546	B-4A
R0548	A-5A
R0601	B-7C
R0602	B-7C
R0603	B-7C
R0604	B-7C
R0605	B-8C
R0606	B-7C
R0607	B-8C
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R0647	B-7D
R0648	B-7D
R0649	B-7B
R0651	B-7C
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R0654	B-7E
R0663	B-6E
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R0666	B-8B
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R0671	B-8B
R0672	B-8B
R0673	B-8B
R0674	B-6E
R0675	A-8B
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R0677	A-7B
R0678	B-6E
R0679	B-6D
R0680	B-6E
R0681	B-6E
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R0683	B-8D
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R0685	B-8D
R0686	B-8D
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R0690	B-8D
R0696	B-7D
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R0701	B-3D
R0705	B-2C
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R0709	B-1D
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R0744	B-2C
R0749	B-2C
R0750	B-2C
R0754	B-1C
R0755	B-1C
R0758	B-1C
R0763	B-6E
R0765	B-6E
R0770	B-6E
R0771	B-7E
R0772	B-7E
R0773	B-7E
R0780	B-1B
R0781	B-2B
R0782	A-1C
R0783	B-2C
R0786	A-2D
R0788	B-2D
R0789	B-3C
R0790	B-2C
R0796	B-2C
R0901	A-4C
R0902	A-5D
R0904	A-5C
R0905	B-7C
R0906	B-6C
R0909	A-3B
R0910	A-6E
R0911	A-5D
R0912	B-5D
R0913	B-3C
R0914	B-3C
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R0916	B-3C
R0917	A-3C
R0918	A-5D
R0920	B-6C
R0921	B-6C
R0922	A-3C
R0923	B-3C
R0924	B-6B
R0925	A-5D
R0926	A-5C
R0928	B-3D
R0934	B-4B
R0935	B-5B
R0936	B-3D
R0937	B-3D
R0938	B-3D
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R0958	B-6C
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R0960	B-3C
R0961	A-4C
R0962	B-5B
R0963	B-5B
R0964	B-5B
R0966	B-5D
R0969	B-4B
R0970	B-5C
R0975	B-6D
R0978	A-3B
R0979	B-3C
R0980	B-3B
R0988	A-4D
R0990	A-4D
R0993	B-3D
R0994	B-3D
R0995	B-3D
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R1362	B-3A
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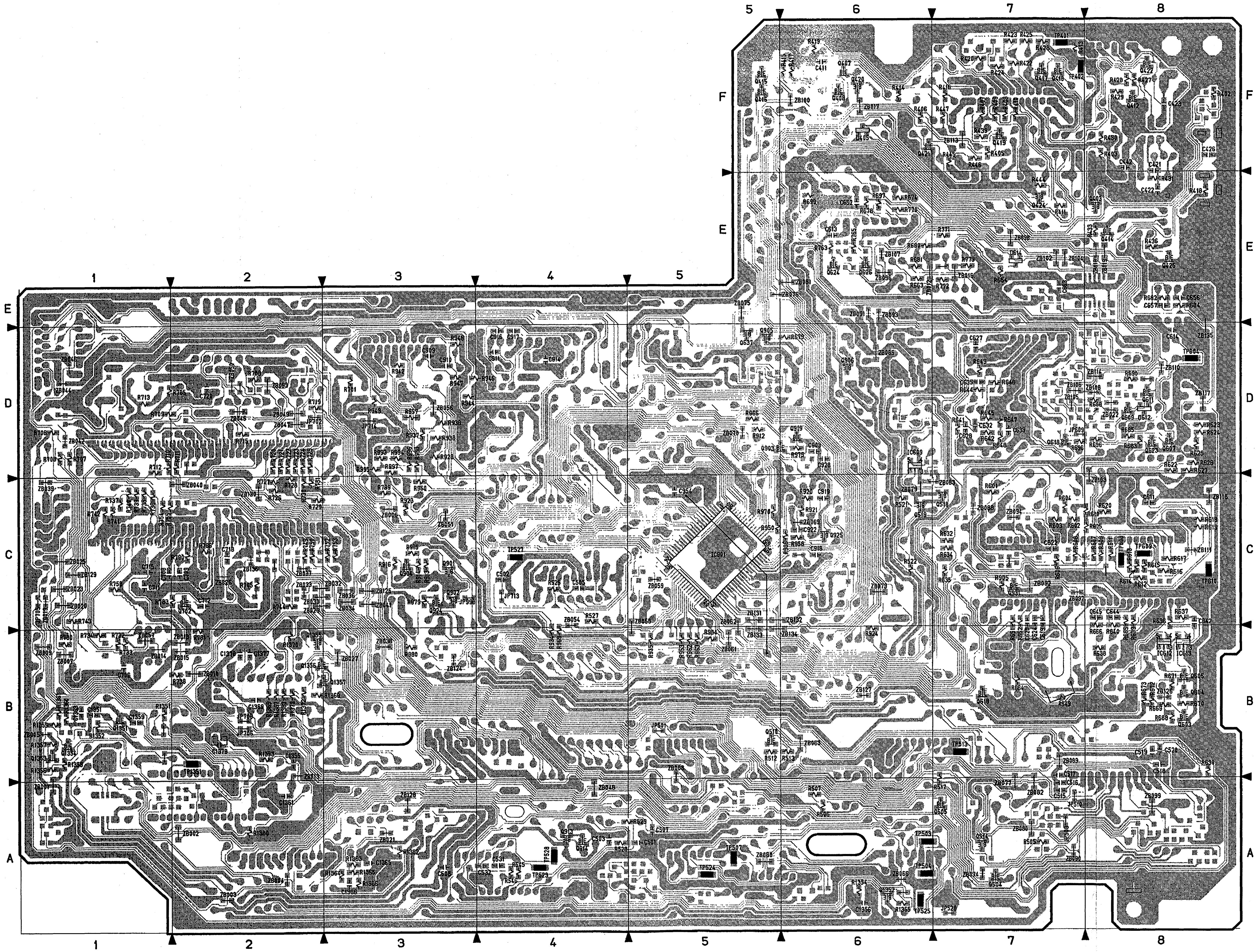
R1365	B-3A
R1366	B-3A
R1367	B-2B
R1368	B-2B
R1369	B-2B
R1370	B-2B
R1371	A-2B
R1372	B-2B
R1373	B-2B
R1375	A-2B
R1376	A-2B
R1377	A-2B
R1379	A-2B
R1380	B-2A
R1381	A-1A
R1382	B-2B
RJ	
RJ0401	A-8F
RT	
RT0401	A-8F
RT0402	A-5F
RT0601	A-7C
RT1351	A-2A
T	
T0401	A-8F
TP	
TP0401	B-7F
TP0402	B-7F
TP0503	B-6A
TP0504	B-6A
TP0507	B-5A
TP0523	B-4A
TP0524	B-5A
TP0525	B-6A
TP0526	A-4A
TP0527	B-4C
TP0528	B-4A
TP0604	B-8D
TP0606	A-7B
TP0607	A-7B
TP0608	B-8C
TP0609	B-8C
TP0610	B-8C
TP1351	B-2B
X	
X0701	A-2C
X0702	A-2C
X0901	A-6C
X1301	A-2B
ZD	
ZD0601	A-8C
ZD0602	A-7E
ZD0701	A-2C
ZD0901	A-4D
ZD0903	A-5C
ZD1351	A-3B
ZD1352	A-3B
ZD1353	A-2B
ZD1354	A-3B

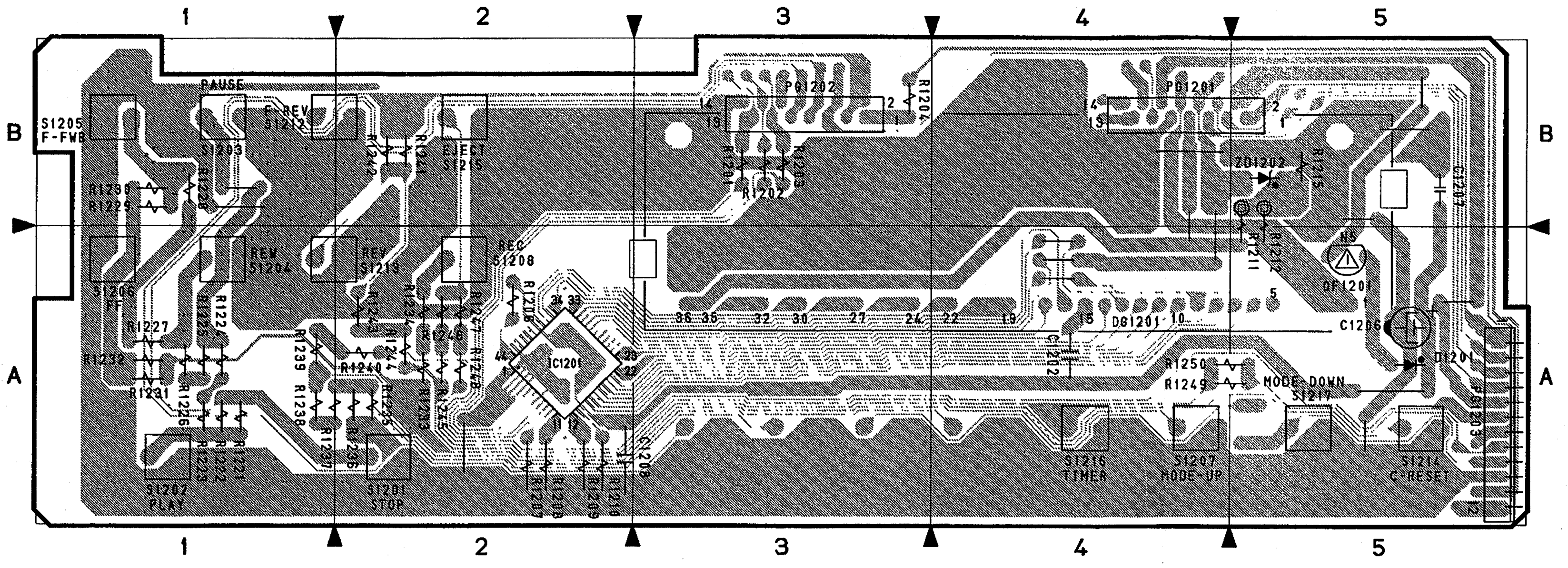
MA CIRCUIT BOARD [SIDE B]


1
2
3
4
5
6
7
8
A
B
C
D
E
F
IC801

MA(MAIN)-SIDE B-

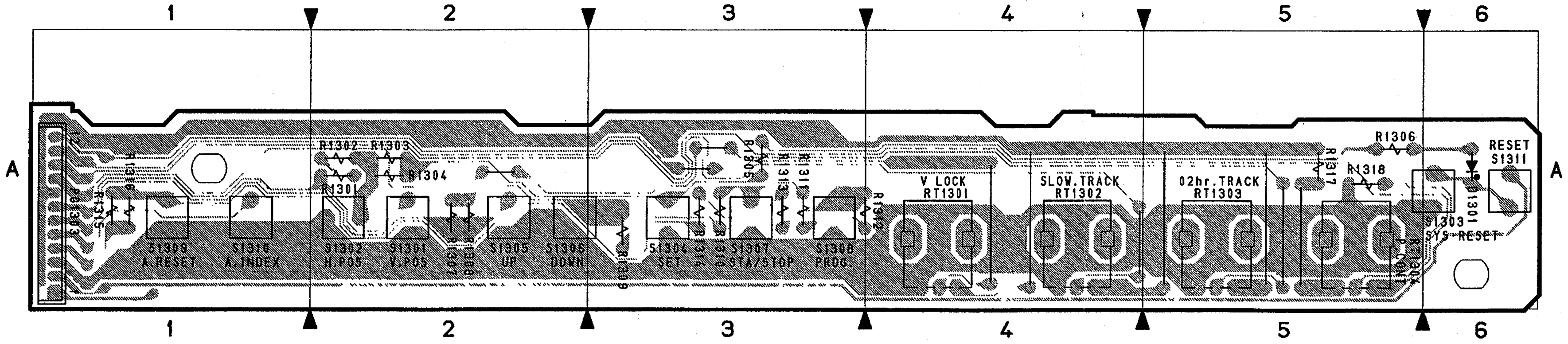
[PATTERN No.JA1149-6]

FIT. FSW. REA. MWB CIRCUIT BOARDS


1
2
3
4
5
A
B
S1205 F-FWD
PAUSE
S1203
F-REV S1212
EJECT S1215
REW S1204
REV S1213
REC S1208
S1206
S1202 PLAY
S1201 STOP
IC1201
PG1202
PG1201
ZD1202
DG1201
MODE-DOWN S1217
S1216 TIMER
S1207 MODE-UP
S1214 C-RESET
D1201
C1206
PG1203
R1230
R1229
R1227
R1232
R1231
R1239
R1238
R1240
R1241
R1250
R1249

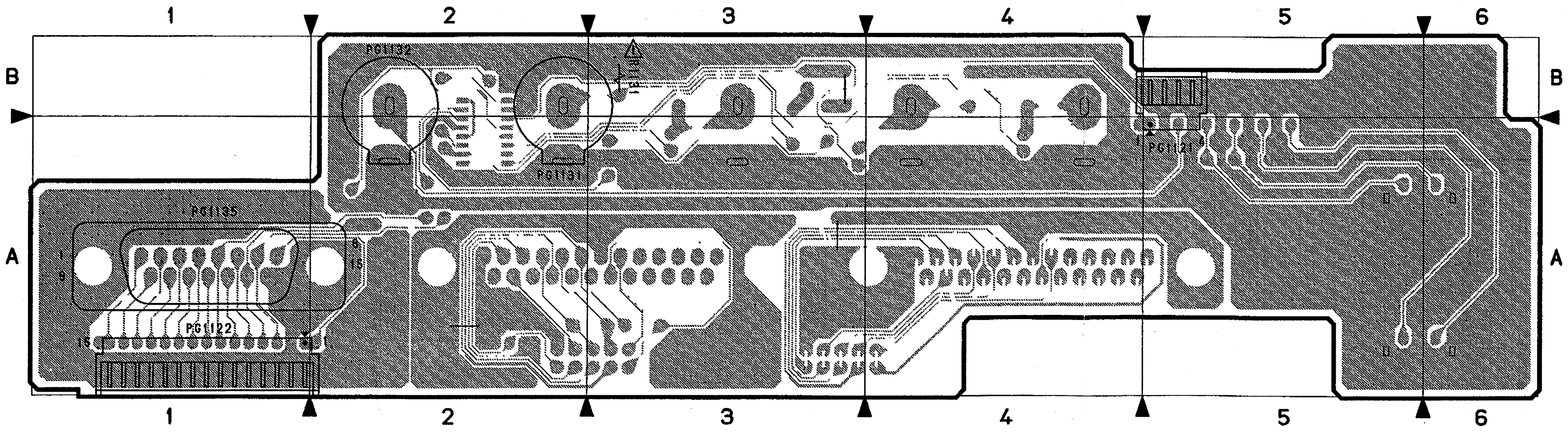
FIT(DISPLAY)

[PATTERN No.JK1220-4]


1
2
3
4
5
6
A
R1302
R1303
R1301
R1304
R1305
R1306
R1317
R1318
RESET S1311
S1309 A.RESET
S1310 A.INDEX
S1302 H.POS
S1301 V.POS
S1305 UP
S1396 DOWN
S1304 SET
S1307 STA/STOP
S1308 PROG.
V LOCK RT1301
SLOW.TRACK RT1302
02hr.TRACK RT1303
S1303 SYS-RESET

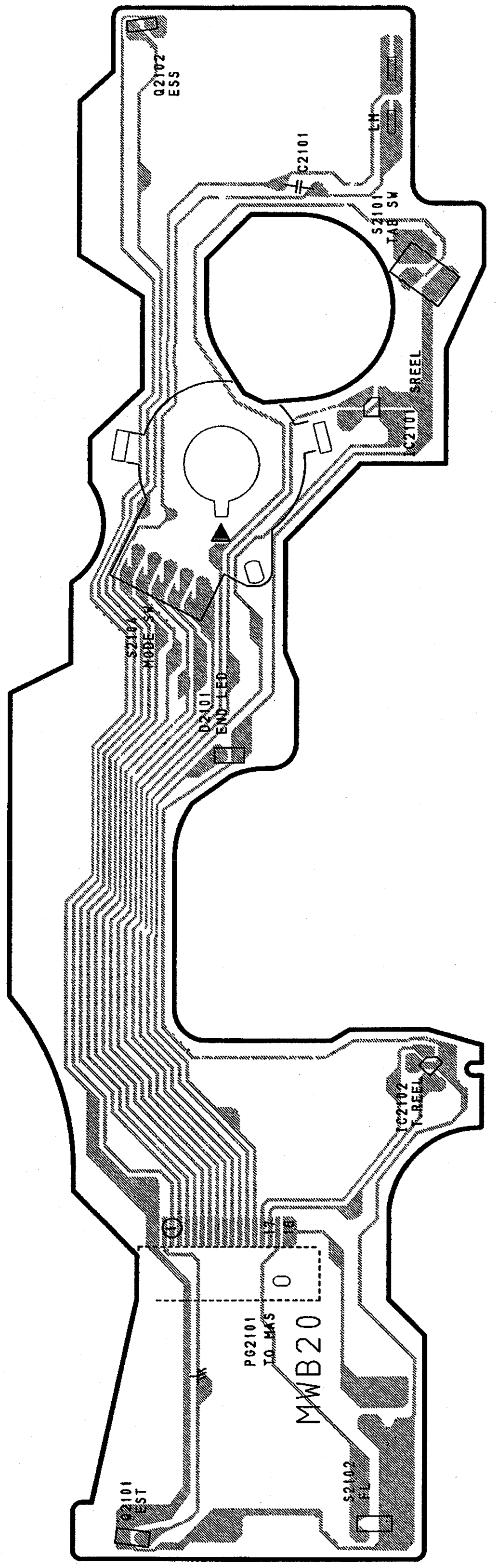
FSW(FRONT SWITCH)

[PATTERN No.JK1220-4]


1
2
3
4
5
6
A
B
PG1132
PG1131
PG1121
PG1135
PG1122
1
9
6
15
15

REA(15P JACK·VIDEO I/O)

[PATTERN No.JK1220-4]


Q2102 ESS
C2101
S2101 TAB SW
Q2101 SREEL
S2104 MODE SW
D2101 END LED
Q2102 T.REEL
PG2101 TO MAS
MWB20
Q2101 EST
S2102 FL

MWB(SENSOR)

[PATTERN No.JK1036-5]

IDENTIFICATION OF PARTS LOCATION

FIT
[DISPLAY]

Symbol No.	Parts Location
C	
C1202	4A
C1206	5A
C1207	5B
C1208	2A
D	
D1201	5A
DG	
DG1201	4A
IC	
IC1201	2A
PG	
PG1201	4B
PG1202	3B
PG1203	5A
QF	
QF1201	5A
R	
R1201	3B
R1202	3B
R1203	3B
R1204	3B
R1206	2A
R1207	2A
R1208	2A
R1209	2A
R1210	2A
R1211	5A
R1212	5A
R1215	5B
R1221	1A
R1222	1A
R1223	1A
R1224	1A
R1225	1A
R1226	1A
R1227	1A
R1228	1B
R1229	1B
R1230	1B
R1231	1A
R1232	1A
R1233	2A
R1234	2A
R1235	2A
R1236	2A
R1237	1A
R1238	1A
R1239	1A
R1240	2A
R1241	2B
R1242	2B
R1243	2A
R1244	2A
R1245	2A
R1246	2A
R1247	2A
R1248	2A
R1249	4A
R1250	4A
S	
S1201	2A
S1202	1A
S1203	1B
S1204	1A
S1205	1B
S1206	1A
S1207	4A
S1208	2A
S1212	1B
S1213	1A
S1214	5A
S1215	2B
S1216	4A
S1217	5A
ZD	
ZD1202	5B

FSW
[FRONT SWITCH]

Symbol No.	Parts Location
D	
D1301	6A
PG	
PG1303	1A
R	
R1301	2A
R1302	2A
R1303	2A
R1304	2A
R1305	3A
R1306	5A
R1307	2A
R1308	2A
R1309	3A
R1310	3A
R1311	3A
R1312	4A
R1313	3A
R1314	3A
R1315	1A
R1316	1A
R1317	5A
R1318	5A
RT	
RT1301	4A
RT1302	4A
RT1303	5A
RT1304	5A
S	
S1301	2A
S1302	2A
S1303	6A
S1304	3A
S1305	2A
S1306	2A
S1307	3A
S1308	3A
S1309	1A
S1310	1A
S1311	6A

REA
[JACK • VIDEO I/O]

Symbol No.	Parts Location
PG	
PG1121	5B
PG1122	1A
PG1131	2B
PG1132	2B
PG1135	1A
R	
R1131	3B

IDENTIFICATION OF PARTS LOCATION

PRE
[PRE/REC AMP]

Symbol No.	Parts Location
C	
C0001	B-4A
C0002	B-4B
C0003	B-4B
C0004	B-5B
C0005	B-4A
C0006	B-5A
C0007	B-5B
C0008	B-5B
C0009	B-5A
C0010	B-5B
C0011	B-5A
C0012	B-4A
C0013	B-5A
C0014	A-4A
C0015	B-4A
C0016	B-4A
C0017	A-4A
C0018	B-4A
C0019	B-5A
C0020	B-5A
C0021	A-5A
C0022	B-5A
C0023	A-5A
D	
D0001	B-2A
D0002	B-2B
D0004	B-3B
IC	
IC0001	A-5A
L	
L0001	A-4B
L0002	A-5B
L0003	A-4A
L0004	A-5A
L0005	A-5A
L0006	A-5A
L0007	A-4A
PG	
PG0001	A-5B
PG0002	A-1A
PG0003	A-2B
Q	
Q0001	B-2B
Q0002	B-5A
Q0003	B-4A
Q0004	B-4A
Q0005	B-3A
R	
R0001	B-4A
R0002	B-4B
R0003	B-4A
R0004	B-5A
R0005	B-5A
R0006	B-5A
R0007	B-5A
R0008	B-5B
R0009	B-4A
R0010	B-4A
R0011	B-5A
R0012	B-5A
R0013	B-4A
R0014	B-4A
R0015	B-4A
R0016	B-4A
R0017	B-4A
R0018	B-2B
R0019	B-2B
R0022	B-4A
R0023	B-3A

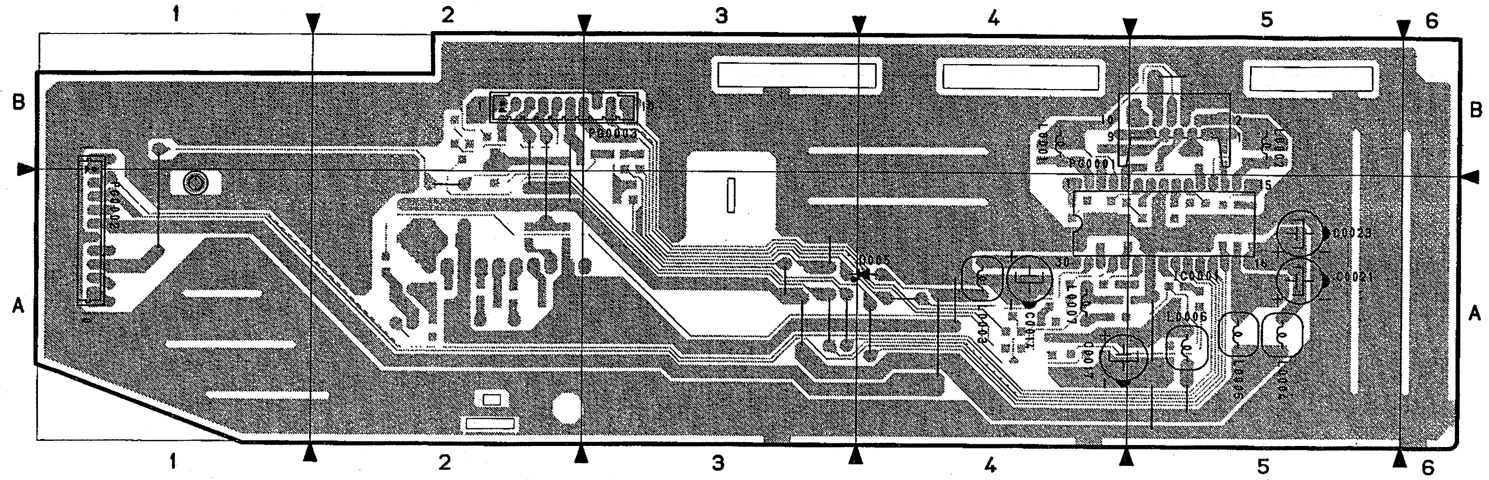
PTR
[POWER TRANS]

Symbol No.	Parts Location
C	
C0852	7B
C0853	7B
C0855	5A
C0856	6A
C0857	6A
C0858	6B
C0859	6A
C0867	6B
C0891	1A
D	
D0851	5B
D0852	6A
D0856	6B
D0857	6A
FU	
FU0851	4B
FU0852	4B
FU0853	2B
L	
L0851	2B
L0852	2B
PG	
PG2853	7B
Q	
Q0851	6B
R	
R0851	6B
R0871	7A
T	
T0852	4A
ZD	
ZD0851	6B

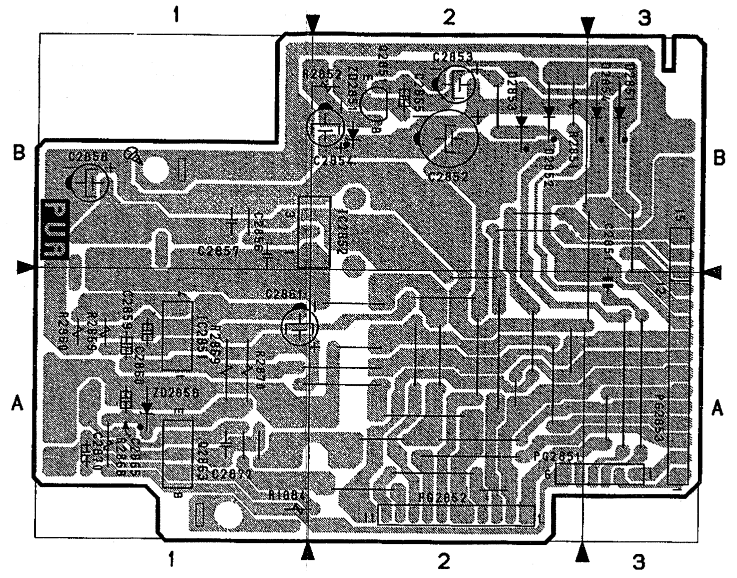
PUR
[REGULATOR]

Symbol No.	Parts Location
C	
C2851	3A
C2852	2B
C2853	2B
C2854	2B
C2855	2B
C2856	1B
C2857	1B
C2858	1B
C2859	1A
C2860	1A
C2861	1A
C2865	1A
C2870	1A
C2872	1A
D	
D2851	3B
D2852	2B
D2853	2B
D2854	3B
IC	
IC2851	1A
IC2852	1B
PG	
PG2851	3A
PG2852	2A
PG2853	3A
Q	
Q2851	2B
Q2863	1A
R	
R1884	1A
R2851	2B
R2852	2B
R2859	1A
R2860	1A
R2868	1A
R2869	1A
R2870	1A
ZD	
ZD2851	2B
ZD2858	1A

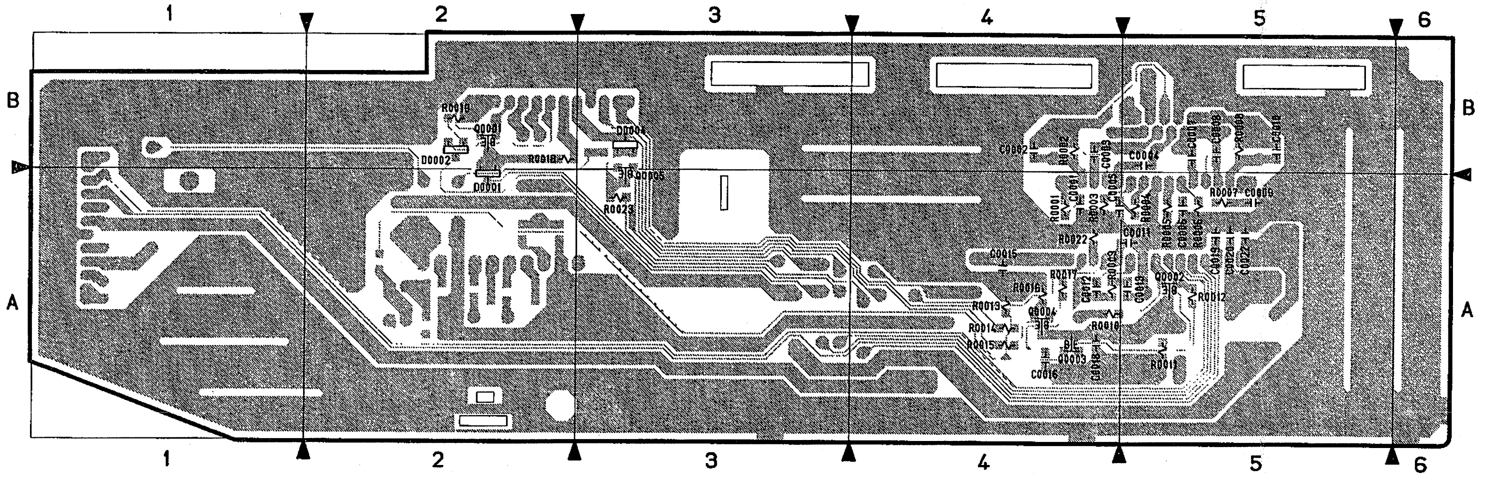
PRE. PTR. PUR. BAT. ECA CIRCUIT BOARDS


1
2
3
4
5
6
B
A
D0023
D0021
L0001
L0006

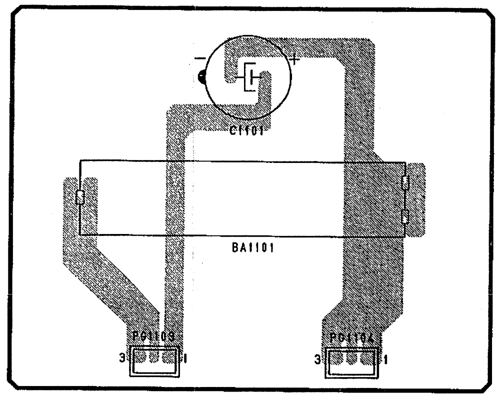
PRE(PRE/REC AMP)-SIDE A-
[PATTERN No.JA1240-2]


1
2
3
B
A
PUR
C2858
C2852
C2857
C2853
C2861
F02851
F02852

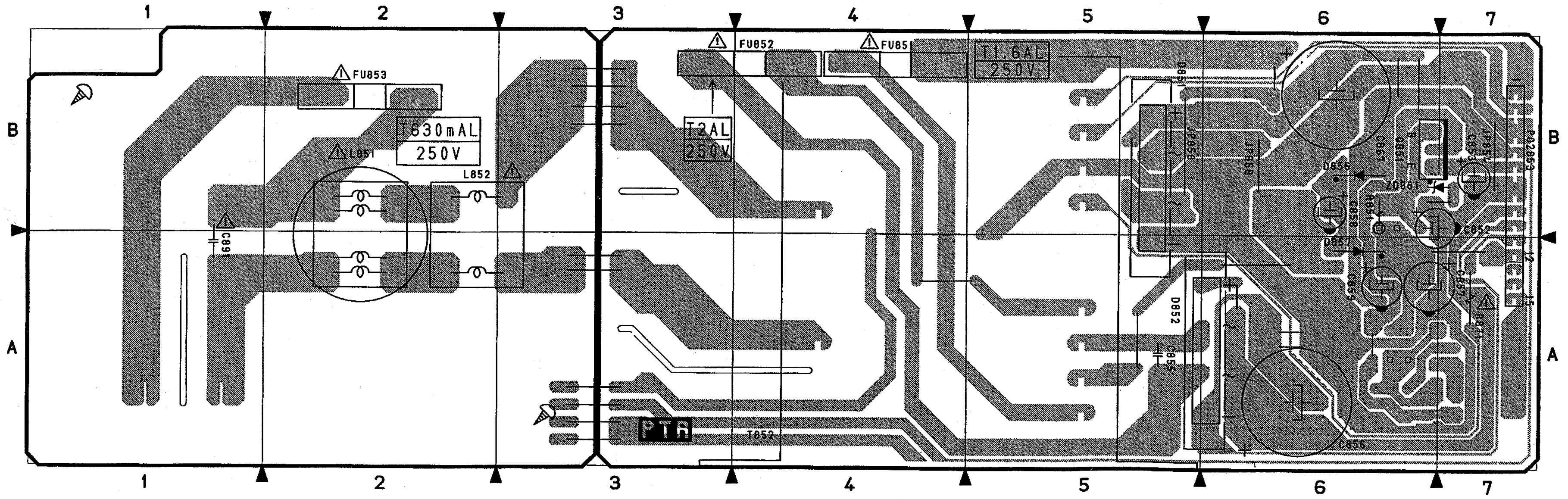
PUR(REGULATOR)
[PATTERN No.JK1220-4]



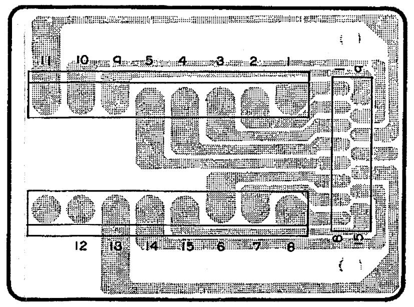
PRE(PRE/REC AMP)-SIDE B-
[PATTERN No.JA1240-2]


C1101
BA1101
3
1
3
1

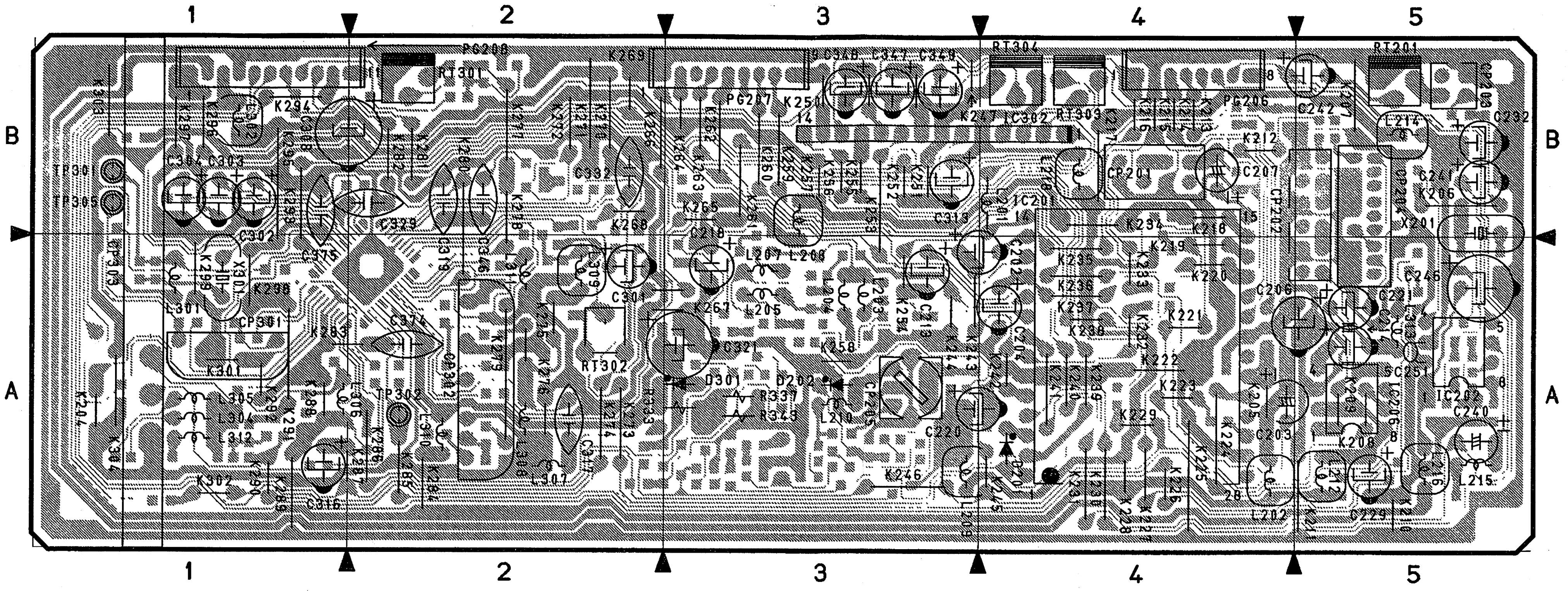
BAT(BATTERY)
[PATTERN No.JK1220-4]


1
2
3
4
5
6
7
B
A
FU853
T630mAL
250V
L851
L852
C891
FU852
FU851
T1.6AL
250V
T2AL
250V
PTR
T852
D852
C856

PTR(POWER TRANS)
[PATTERN No.JK1220-4]

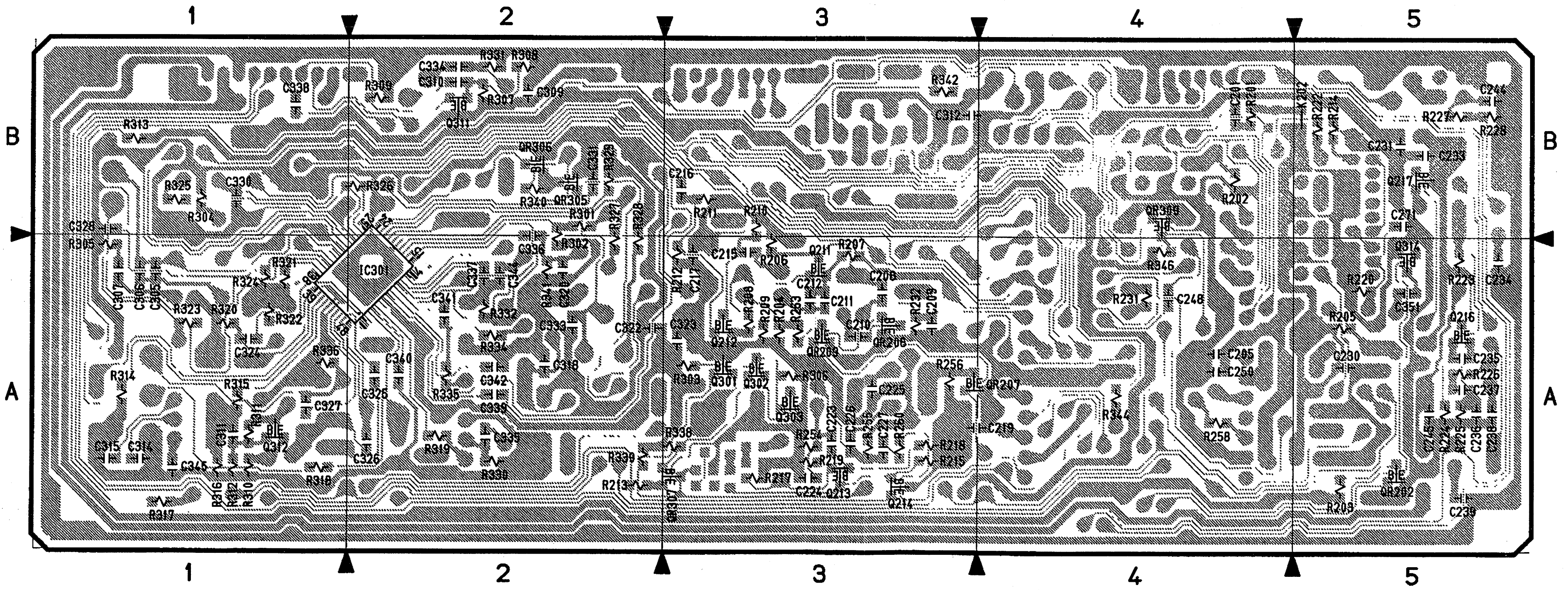

11
10
9
5
4
3
2
1
12
13
14
15
6
7
8

ECA(15PADAPTER)
[PATTERN No.150583-3]



WYC(Y/CHROMA)-SIDE A-

[PATTERN No.151821-3]



WYC(Y/CHROMA)-SIDE B-

[PATTERN No.151821-3]

IDENTIFICATION OF PARTS LOCATION

WYC [Y/CHROMA]

Symbol No.	Parts Location
C	
C0201	B-4B
C0202	A-4A
C0203	A-4A
C0204	A-4A
C0205	B-4A
C0206	A-5A
C0207	A-4B
C0208	B-3A
C0209	B-3A
C0210	B-3A
C0211	B-3A
C0212	B-3A
C0213	A-3A
C0214	A-5A
C0215	B-3A
C0216	B-3B
C0217	B-3A
C0218	A-3A
C0219	B-3A
C0220	A-3A
C0221	A-5A
C0223	B-3A
C0224	B-3A
C0225	B-3A
C0226	B-3A
C0227	B-3A
C0229	A-5A
C0230	B-5A
C0231	B-5B
C0232	A-5B
C0233	B-5B
C0234	B-5A
C0235	B-5A
C0236	B-5A
C0237	B-5A
C0238	B-5A
C0239	B-5A
C0240	A-5A
C0241	A-5B
C0242	A-5B
C0244	B-5B
C0245	B-5A
C0246	A-5A
C0248	B-4A
C0250	B-4A
C0251	A-5A
C0271	B-5B
C0301	A-2A
C0302	A-1B
C0303	A-1B
C0304	A-1B
C0305	B-1A
C0306	B-1A
C0307	B-1A
C0308	A-1B
C0309	B-2B
C0310	B-2B
C0311	B-1A
C0312	B-3B
C0313	A-3B
C0314	B-1A
C0315	B-1A
C0316	A-1A
C0317	A-2A
C0318	B-2A
C0319	A-2B
C0320	B-2A
C0321	A-3A
C0322	B-2A
C0323	B-3A
C0324	B-1A
C0325	B-2A
C0326	B-2A
C0327	B-1A
C0328	B-1B
C0329	A-2B
C0330	B-1B
C0331	B-2B
C0332	A-2B
C0333	B-2A
C0334	B-2B
C0335	B-2A
C0336	B-2A
C0337	B-2A
C0338	B-1B
C0339	B-2A
C0340	B-2A
C0341	B-2A
C0342	B-2A
C0344	B-2A
C0345	B-1A
C0346	A-2B
C0347	A-3B
C0348	A-3B
C0349	A-3B
C0351	B-5A
C0374	A-2A
C0375	A-1B
CP	
CP0201	A-4B
CP0202	A-5B
CP0203	A-5B
CP0204	A-5B
CP0205	A-3A
CP0301	A-1A
CP0302	A-2A
CP0303	A-1A
D	
D0201	A-4A
D0202	A-3A
D0301	A-3A
IC	
IC0201	A-4A
IC0202	A-5A
IC0206	A-5A
IC0301	B-2A
IC0302	A-4B
L	
L0201	A-4B
L0202	A-4A
L0203	A-3A
L0204	A-3A
L0205	A-3A
L0207	A-3A
L0208	A-3B
L0209	A-3A
L0210	A-3A
L0212	A-5A
L0214	A-5B
L0215	A-5A
L0216	A-5A
L0218	A-4B
L0301	A-1A
L0302	A-1B
L0304	A-1A
L0305	A-1A
L0306	A-1A
L0307	A-2A
L0308	A-2A
L0309	A-2A
L0310	A-2A
L0311	A-2A
L0312	A-1A
L0313	A-5A
PG	
PG0206	A-4B
PG0207	A-3B
PG0208	A-1B
Q	
Q0211	B-3A
Q0212	B-3A
Q0213	B-3A
Q0214	B-3A
Q0216	B-5A
Q0217	B-5B
Q0301	B-3A
Q0302	B-3A
Q0303	B-3A
Q0311	B-2B
Q0312	B-1A
Q0314	B-5A
QR	
QR0202	B-5A
QR0206	B-3A
QR0207	B-3A
QR0209	B-3A
QR0305	B-2B
QR0306	B-2B
QR0307	B-3A
QR0309	B-4B
R	
R0201	B-4B
R0202	B-4B
R0203	B-5A
R0204	B-3A
R0205	B-5A
R0206	B-3A
R0207	B-3A
R0208	B-3A
R0209	B-3A
R0210	B-3B
R0211	B-3B
R0212	B-3A
R0213	B-2A
R0214	B-5B
R0215	B-3A
R0217	B-3A
R0218	B-3A
R0219	B-3A
R0220	B-5A
R0222	B-5B
R0223	B-5A
R0224	B-5A
R0225	B-5A
R0226	B-5A
R0227	B-5B
R0228	B-5B
R0231	B-4A
R0232	B-3A
R0254	B-3A
R0255	B-3A
R0256	B-3A
R0258	B-4A
R0260	B-3A
R0263	B-3A
R0301	B-2B
R0302	B-2A
R0303	B-3A
R0304	B-1B
R0305	B-1A
R0306	B-3A
R0307	B-2B
R0308	B-2B
R0309	B-2B
R0310	B-1A
R0311	B-1A
R0312	B-1A
R0313	B-1B
R0314	B-1A
R0315	B-1A
R0316	B-1A
R0317	B-1A
R0318	B-1A
R0319	B-2A
R0320	B-1A
R0321	B-1A
R0322	B-1A
R0323	B-1A
R0324	B-1A
R0325	B-1B
R0326	B-2B
R0327	B-2B
R0328	B-2B
R0329	B-2B
R0330	B-2A
R0331	B-2B
R0332	B-2A
R0333	A-3A
R0334	B-2A
R0335	B-2A
R0336	B-1A
R0337	A-3A
R0338	B-3A
R0339	B-2A
R0340	B-2B
R0341	B-2A
R0342	B-3B
R0344	B-4A
R0346	B-4A
R0348	A-3A
RT	
RT0201	A-5B
RT0301	A-2B
RT0302	A-2A
RT0303	A-4B
RT0304	A-4B
TP	
TP0301	A-1B
TP0302	A-2A
TP0305	A-1B
X	
X0201	A-5B
X0301	A-1A

CHAPTER 8 MICROPROCESSOR PIN FUNCTION TABLE/ BLOCK DIAGRAMS

1. Microprocessor (μ P) Pin Function Tables

1-1. SUB- μ P (IC1201) Pin Functions

Pin No.	I/O	Active Level	Abbreviation	Function
1	-	-	SW1	Grounded.
2	-	-	SW2	
3	-	-	SW3	
4	-	-	SW4	
5	-	-	-	Not used.
6	I	Pulse	DATA (M-CG/SUB)	Common communications lines between the MAIN- μ P and SUB- μ P character generator ; data is communicated synchronized with the clock signal.
8	I	Pulse	CLK (M-CG/SUB)	
7	-	-	VSS	Grounded.
9	I	Hi	STB (M-SUB)	Strobe signal from the MAIN- μ P.
10	I	Hi	KEY 1	Key inputs.
11	I	Hi	KEY 2	
12	I	Hi	KEY 3	
13	I	Hi	KEY 4	
14	I	-	Vdd	5V power input.
15	O	Pulse	SEGMENT (a)	FL display segment control outputs. Synchronized with the grid control outputs at pins 29-37.
16	O	Pulse	SEGMENT (b)	
17	O	Pulse	SEGMENT (c)	
18	O	Pulse	SEGMENT (d)	
19	O	Pulse	SEGMENT (e)	
20	O	Pulse	SEGMENT (f)	
21	O	Pulse	SEGMENT (g)	
22	O	Pulse	SEGMENT (h)	
23	O	Pulse	SEGMENT (i)	
24	-	-	-	Not used.
25	-	-	-	
26	-	-	-	
27	I	-	VEE	-30V pull-down power input for the FL display.
28	-	-	-	Not used.
29	O	Pulse	GRID (9)	FL display grid control outputs. Synchronized with the segment control outputs at pins 15-23.
30	O	Pulse	GRID (8)	
31	O	Pulse	GRID (7)	
32	O	Pulse	GRID (6)	
33	O	Pulse	GRID (5)	
34	O	Pulse	GRID (4)	
35	O	Pulse	GRID (3)	
36	O	Pulse	GRID (2)	
37	O	Pulse	GRID (1)	
38	I	-	Vdd	5V power input.
39	-	-	-	Not used.
40	-	-	-	
41	-	-	-	
42	-	-	-	
43	-	-	VSS	Grounded.
44	I	Pulse	OSC	Oscillator input.

1-2. MAIN- μ P (IC1701) Pin Functions

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	Pulse	STB (M-SUB)	Outputs the strobe signal to the SUB- μ P.
2	O	Pulse	DATA (M-CG/SUB)	Common communications lines between the MAIN- μ P and character generator/SUB- μ P , data is communicated synchronized with the clock signal.
3	O	Pulse	CLK (M-CG/SUB)	
4	O	Pulse	STB (M-CG)	Outputs the strobe signal to the character generator.
5	I	Pulse	BUSY-OSD	BUSY signal input from character generator.
6	I	Pulse	DATA (S-M)	Common communications lines between the system control μ P and MAIN- μ P ; date is communicated synchronized with the clock signal.
7	O	Pulse	DATA (M-S)	
8	O	Pulse	CLK (M-S)	
9	O	Pulse	SOFT RUN	PWM output to control the voltage applied to the capstan during soft-landing.
10	O	-	-	Not used.
11	O	Pulse	45Hz	Outputs a reference signal to control the capstan phase in the A12 and A24 modes.
12	I/O	Hi/Lo	CLR/BW	"Hi" is output when B/W is specified as the VIDEO MODE option, "Lo" is output when COLOUR is specified and a signal is input when AUTO isspecified.
13	I	Lo	-	Mode selection.
14	I	Hi	-	Mode selection.
15	O	-	-	Not used.
16	I	Lo	HEAD RESET	When "Lo" is input, the MAIN- μ P resets the cylinder time of use.
17	-	-	GND	Grounded.
18	O	Hi	CS SYS	Chip select signal between the MAIN- μ P and SYS.CON- μ P.
19	O	-	-	Not used.
20	O	-	-	Not used.
21	-	-	-	Not used.
22	O	Pulse	DATA (M-ROM)	Communications lines between the MAIN- μ P and EEPROM , data is communicated synchronized with the clock signal.
60	I	Pulse	DATA (ROM-M)	
61	O	Pulse	CLK (M-ROM)	
23	-	-	-	Not used.
24	O	Hi	BLK/WHT	OSD character colour control output. (Hi : Black, Lo : White)
25	O	Hi	RESET	"Hi" ooutput resets the SYS.CON- μ P.
26	I	Lo	ALARM IN	Alarm recording start input.
27	I	-	-	Not used.
28	I	Lo	ALARM REC RST	When "Lo" is input, ALARM REC is stopped.
29	I	Lo	TAPE END RESET	When "Lo" is input, TAPE END OUT is stopped.
30	I	Lo	REC START IN	When "Lo" is input, recording is started.
31	-	-	-	Not used.
32	-	-	VSS	Grounded.
33	O	-	-	Not used.
34	O	-	-	Not used.
35	O	Hi	ALARM OUT	Outputs "Hi" during alarm recording. Outputs pulses after alarm recording is ended.
36	O	Hi	TAPE END OUT	Outputs "Hi" when the tape reaches its end during recording.
37	-	-	-	Not used.
38	-	-	-	Not used.
39	-	-	-	Not used.
40	-	-	-	Not used.
41	O	Pulse	CAM SW OUT	Outputs the timing pulse to switch the recording and camera when an auto switcher is connected.
42	O	-	-	Not used.
43	I	Lo	RESET	Reset input.
44	-	-	GND	Grounded.

Pin No.	I/O	Active Level	Abbreviation	Function
45	I	Hi	REC MUTE	Timing signal input for CAM SW output.
46	I	Pulse	AC CLOCK	Power supply clock signal input. Used to count the clock and detect a power failure.
47	I	Pulse	V.SYNC	Input to detect whether the video signal is input or not.
48	-	-	5V	A5V power input.
49	-	-	X2	System clock signal in modes other than the back-up mode.
50	I	-	X1	
51	-	-	GND	Grounded.
52	-	-	XT2	Clock signal of the clock in the back-up mode.
53	I	-	XT1	
54	-	-	GND	Grounded.
55	I	Hi/Lo	LADDER 1	A/D inputs to detect that buttons on the front panel have been pressed.
56	I	Hi/Lo	LADDER 2	
57	I	Hi/Lo	LADDER 3	
58	I	Hi/Lo	LADDER 4	
59	-	-	-	Not used.
62	O	Pulse	LOAD (M-ROM)	LOAD signal between the MAIN- μ P and EEP ROM.
63	-	-	5V	5V power inputs.
64	I	-	5V	

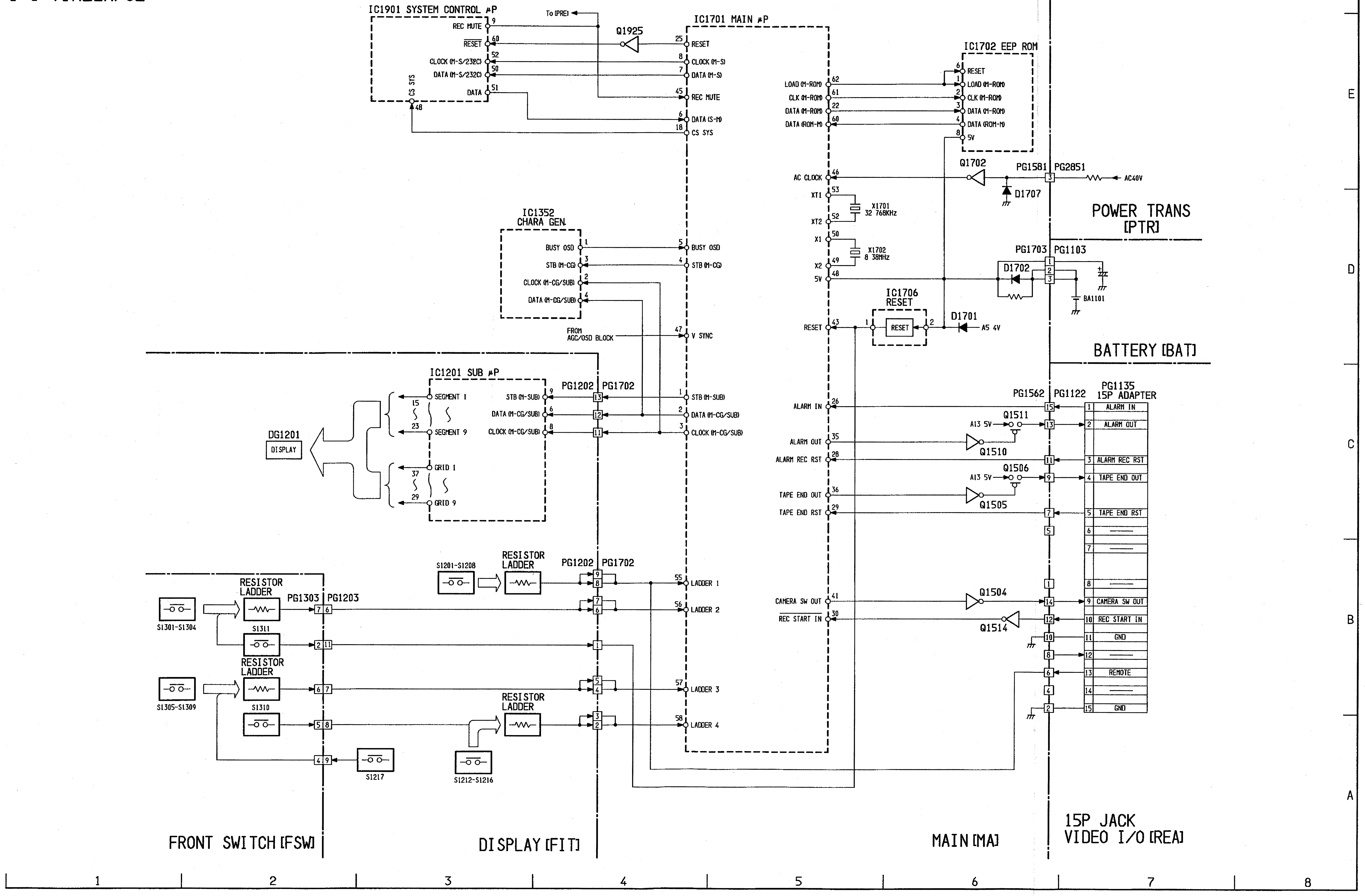
1-3. System Control μ P (IC1901) Pin Functions

Pin No.	I/O	Active Level	Abbreviation	Function
1	I	A/D	FL/TAB	Safety tab/cassette position detection input. H : TAB SW OFF (with tab) , M : TAB SW ON (without tab) , L : When cassette is being inserted/ejected. When a cassette without its safety tab is inserted, recording is inhibited and the cassette is ejected automatically in the timer recording state.
2	I	-	5V	A5V power inputs.
3	I	-	5V	
4	I	-	5V	
5	I	Lo	FWD END	When a "Lo" pulse is input from the sensor in the mechanism, the current mode is released. The end sensors each detect one end of the tape. When "Lo" pulses are input from both sensors, it is detected that a cassette is not inserted.
6	I	Lo	REW END	
7	I	Pulse	S.REEL	The period of the take-up reel pulses is calculated to detect whether slack tape has been taken up or not. When slack tape is detected, the mechanism is stopped. The supply reel pulses are used together with the take-up reel pulses to calculate the tape remaining time in the rewind mode.
8	I	Pulse	T.REEL	
9	O	Hi	REC MUTE	Video signal record muting control. Prevents the signal from being supplied to the video heads.
10	O	Hi	SLOW	Controls the voltage applied to the capstan motor.
11	O	Hi	REC (AUDIO)	Sets the audio circuits to the record mode.
12	O	-	-	Not used.
13	O	Hi	REC (VIDEO)	Sets the video circuits to the record mode and controls the REC9V power supply.
14	O	Hi	PB	Sets the video/audio circuits to the playback mode.
15	-	-	-	Not used.
16	O	Hi	LINE MUTE	Audio signal record and playback muting control. Prevents the signal from being supplied to the audio head.
17	I	-	X-TEST	A5V power input.
18	-	-	-	Not used.
19	I	Pulse	CFG.DIV	CFG divided frequency signal input. Used to detect whether or not the slack tape is taken up onto the supply reel in the eject mode.
20	-	-	-	Not used.
21	I	Hi/Lo	M.STATE 1	Mechanism state detection signal inputs to control the loading motor.
22	I	Hi/Lo	M.STATE 2	
23	I	Hi/Lo	M.STATE 3	
24	I	Hi/Lo	M.STATE 4	
25	-	-	-	Not used.
26	I	Hi	DUTY	Index detection input from the main servo IC.
27	-	-	-	Not used.
28	O	Hi	TRN./SER+FHS	Output to control the switching of the operation of the double azimuth heads and the head switching control output during slow play.
29	O	Hi	UNLOAD	Signals that drive the loading motor to set the mechanism to the specified mode.
30	O	Hi	LOAD	
31	-	-	-	Not used.
32	-	-	-	
33	-	-	GND	Grounded.
34	O	Hi	03Hr	Tape speed (hours) mode control outputs.
35	O	Hi	12Hr	
36	O	Hi	24Hr	
37	O	Hi	48Hr	
38	O	Hi/Mi/Lo	CAPST.CONT	Selects the capstan motor control mode. H : Reel (voltage control) mode, M (open) Servo output control mode, L Brake mode
39	O	Hi	fH CORRECT 1	Cylinder speed correction outputs during frame advance. For the correction of horizontal jitter.
40	O	Hi	fH CORRECT 2	
41	O	Hi	SP HS	Video head switching select output.
42	O	Hi	SKEW	Skew correction output during time-lapse recording.
43	O	Hi	CTL CONT	CTL timing output during recording.

Pin No.	I/O	Active Level	Abbreviation	Function
44	O	Hi	REVERSE	Reverse mode control output. Drives the capstan motor in reverse.
45	-	-	-	Not used.
46	I	Lo	CTL	CTL pulse input for the slow play mode. CTL pulse input for the linear time counter.
47	I	Lo	CTL DIV	
48	I	Pulse	CS SYS	Chip select signal between the MAIN- μ P and SYS.CON- μ P.
49	I	Pulse	SW25Hz	Monitors the period of the SW25Hz signal to detect an abnormality in the cylinder motor drive. Stops the cylinder motor if an abnormality is detected. This is also used as the head switching signal during playback.
50	I	Pulse	DATA (M-S)	Common communications lines between the MAIN- μ P and SYS.CON- μ P , data is communicated synchronized with the clock signal.
51	O	Pulse	DATA (S-M)	
52	I	Pulse	CLK (M-S)	
53	I	Pulse	CFG/REV.CFG	The divided CFG pulses are input during playback. The capstan rotation sensor detection signal is input during recording.
54	-	-	GND	Grounded.
55	-	-	GND	
56	-	-	-	Not used.
57	-	-	GND	Grounded.
58	I	-	X1	Inputs to generate the system clock.
59	I	-	X2	
60	I	Lo	RESET	Initializes the SYS.CON- μ P when power is supplied.
61	O	Lo	SKEW2	Skew correction output during time-lapse recording.
62	O	Pulse	CLK (S-SRV)	Data bus lines between the SYS.CON- μ P and main servo IC , data is transferred to the main servo IC synchronized with the clock signal.
63	O	Pulse	DATA (S-SRV)	
64	O	Lo	DS	CH-1/CH-2 head switching signal.
65	-	-	-	Not used.
66	O	Hi	TRICK PLAY	Trick play mode signal. The line correlative noise canceller is removed from the video circuit and the peaking frequency of the 4.6MHz peaking circuits changed to 4.2MHz.
67	-	-	-	Not used.
68	-	-	-	
69	-	-	-	
70	O	Lo	POWER ON	Control signal to prevent the capstan motor from malfunctioning immediately after power is supplied.
71	-	-	-	Not used.
72	O	Hi	SLOW BRAKE	Signal to control the voltage applied to the capstan motor when slow braking is applied.
73	-	-	GND	Grounded.
74	-	-	GND	
75	-	-	GND	
76	-	-	-	Not used.
77	-	-	-	
78	I	0-5V	V.LOCK	Picture control voltage input during still play
79	I	0-5V	SLOW TRACK	Tracking voltage input during slow play.
80	I	0-5V	03Hr TRACK	Tracking voltage input during playback.

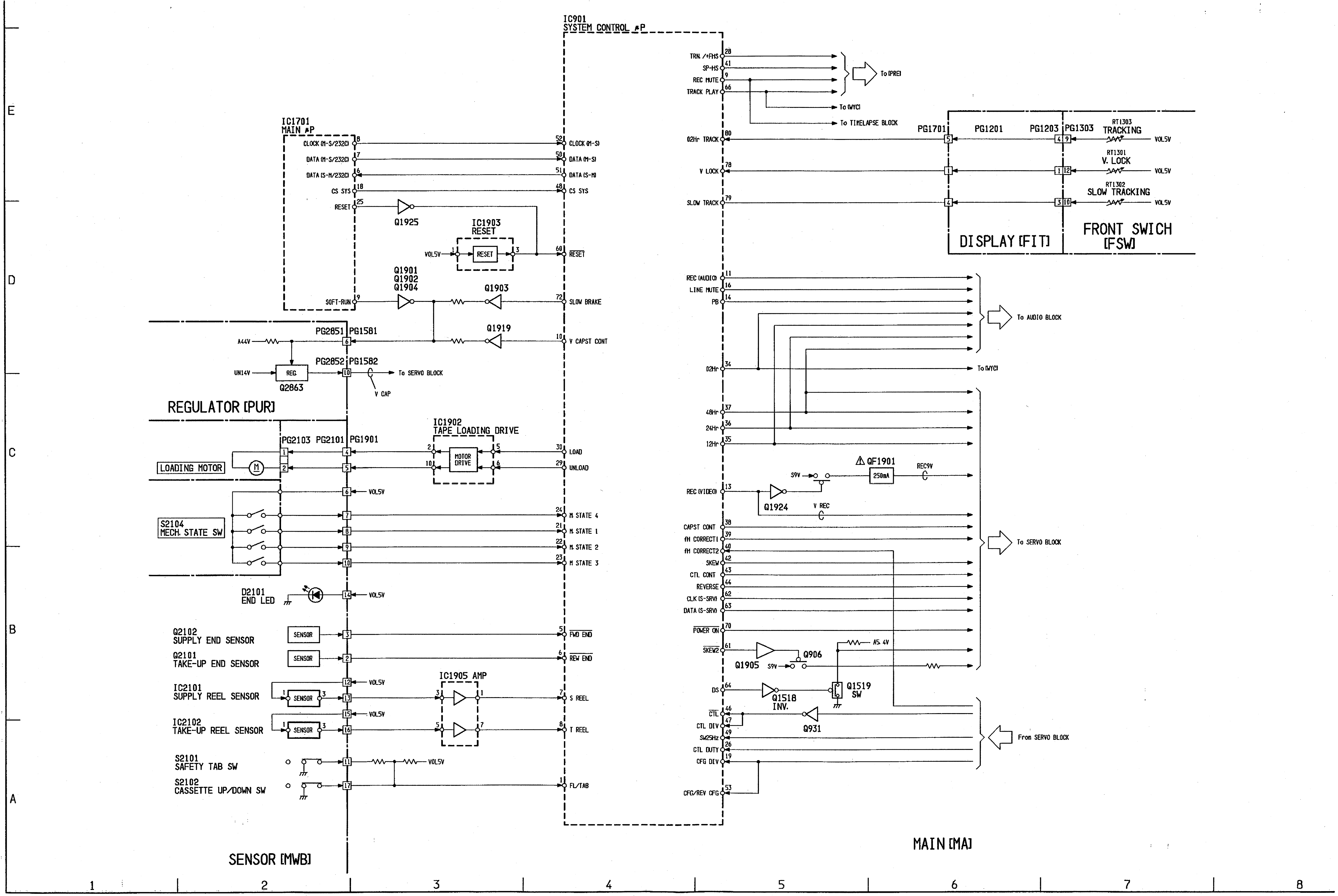
MEMO

2. BLOCK DIAGRAMS
1-1. TIMELAPSE

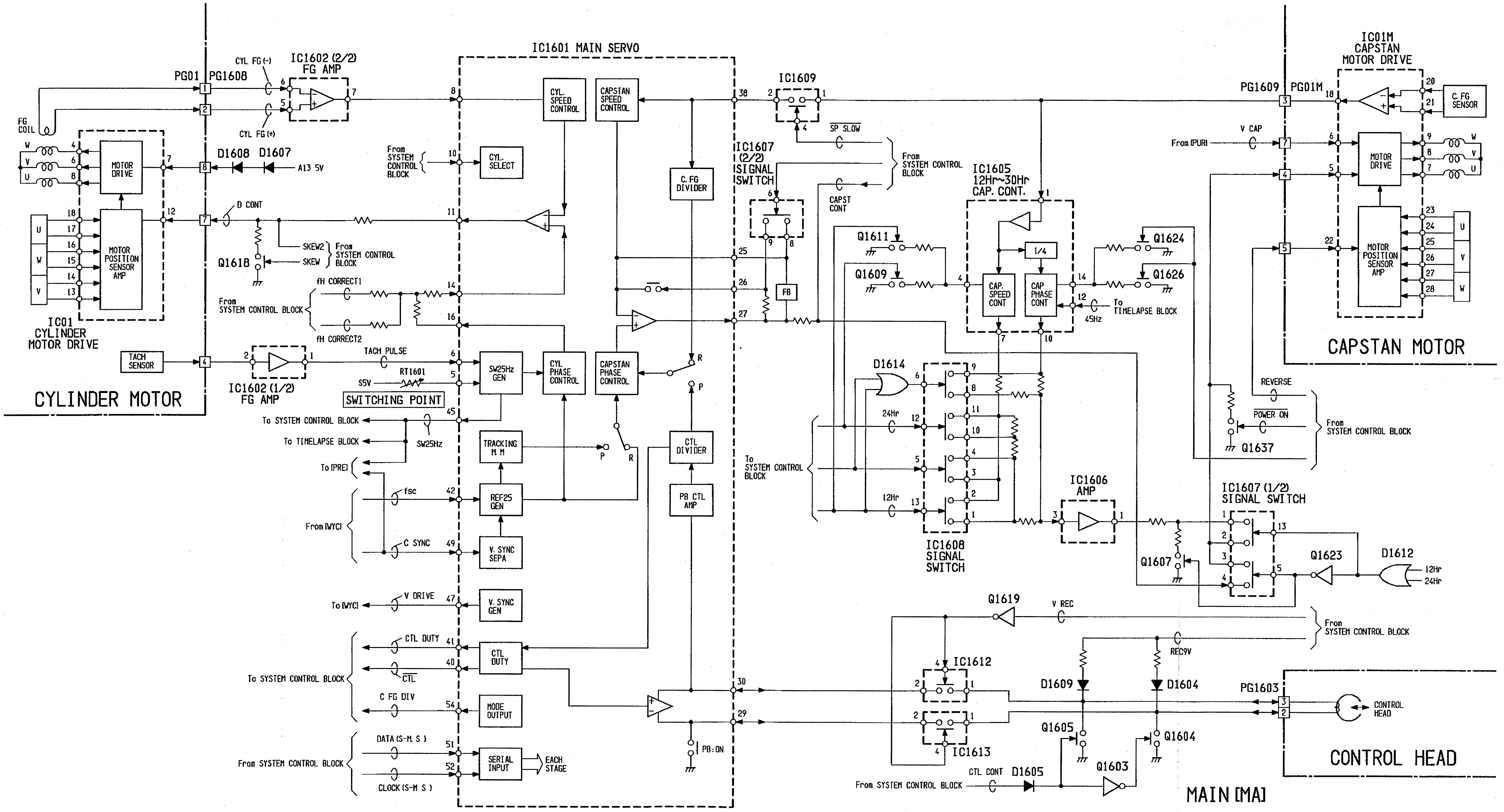


IC1901 SYSTEM CONTROL µP
REC MUTE
RESET
CLOCK (M-S/232C)
DATA (M-S/232C)
DATA
CS SYS
To (PRE)
Q1925
IC1701 MAIN µP
RESET
CLOCK (M-S)
DATA (M-S)
REC MUTE
DATA (S-M)
CS SYS
IC1702 EEP ROM
LOAD (M-ROM)
CLK (M-ROM)
DATA (M-ROM)
DATA (ROM-M)
5V
AC CLOCK
XT1
XT2
X1
X2
X1701
32 768KHz
X1702
8 38MHz
Q1702
PG1581
PG2851
AC40V
D1707
POWER TRANS [PTR]
PG1703
PG1103
D1702
BA1101
IC1706 RESET
D1701
A5 4V
BATTERY [BAT]
IC1352 CHARA GEN.
BUSY OSD
STB (M-CG)
CLOCK (M-CG/SUB)
DATA (M-CG/SUB)
FROM AGC/OSD BLOCK
V SYNC
IC1201 SUB µP
SEGMENT 1
SEGMENT 9
GRID 1
GRID 9
STB (M-SUB)
DATA (M-CG/SUB)
CLOCK (M-CG/SUB)
PG1202
PG1702
DG1201
DISPLAY
PG1562
PG1122
PG1135 15P ADAPTER
ALARM IN
ALARM OUT
ALARM REC RST
TAPE END OUT
TAPE END RST
CAMERA SW OUT
REC START IN
GND
REMOTE
Q1511
A13 5V
Q1510
Q1506
Q1505
Q1504
Q1514
S1201-S1208
RESISTOR LADDER
LADDER 1
LADDER 2
LADDER 3
LADDER 4
PG1303
PG1203
S1301-S1304
S1311
S1305-S1309
S1310
S1217
S1212-S1216
FRONT SWITCH [FSW]
DISPLAY [FIT]
MAIN [MA]
15P JACK VIDEO I/O [REA]
1
2
3
4
5
6
7
8
A
B
C
D
E

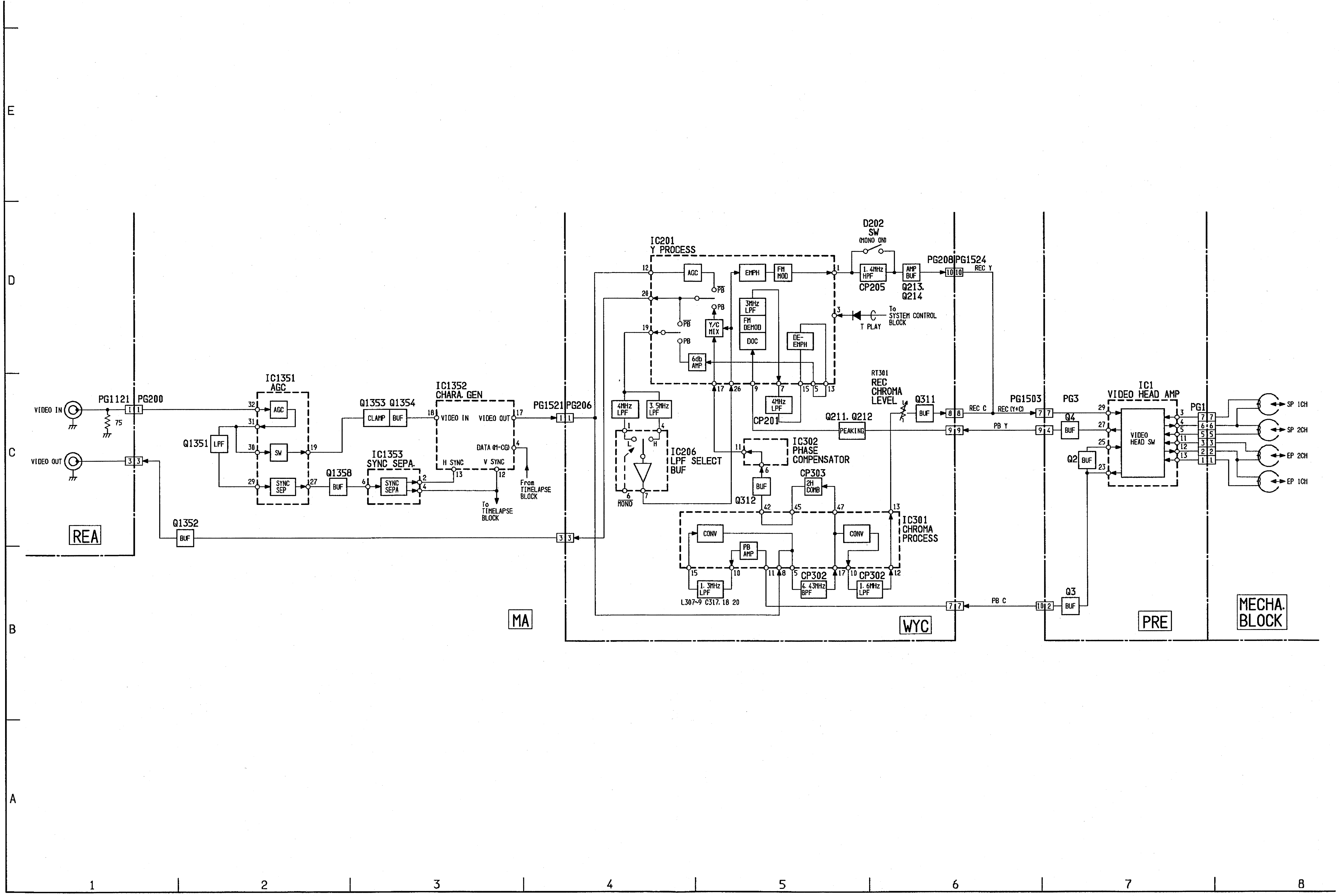
1-2. SYSTEM CONTROL


IC901
SYSTEM CONTROL μP
TRN /+FHS
SP-HS
REC MUTE
TRACK PLAY
To [PRE]
To [Y/C]
To TIMELAPSE BLOCK
02Hr TRACK
V LOCK
SLOW TRACK
PG1701
PG1201
PG1203
PG1303
RT1303
TRACKING
RT1301
V. LOCK
RT1302
SLOW TRACKING
VOL5V
DISPLAY [FIT]
FRONT SWICH
[FSW]
IC1701
MAIN μP
CLOCK (M-S/232C)
DATA (M-S/232C)
DATA (S-M/232C)
CS SYS
RESET
Q1925
IC1903
RESET
CLOCK (M-S)
DATA (M-S)
DATA (S-M)
RESET
Q1901
Q1902
Q1904
Q1903
SOFT-RUN
SLOW BRAKE
Q1919
V CAPST CONT
PG2851
PG1581
A44V
PG2852
PG1582
UN14V
REG
Q2863
To SERVO BLOCK
V CAP
REGULATOR [PUR]
IC1902
TAPE LOADING DRIVE
MOTOR DRIVE
PG2103
PG2101
PG1901
LOADING MOTOR
M
LOAD
UNLOAD
S2104
MECH. STATE SW
M STATE 4
M STATE 1
M STATE 2
M STATE 3
D2101
END LED
Q2102
SUPPLY END SENSOR
Q2101
TAKE-UP END SENSOR
SENSOR
FWD END
REW END
IC1905 AMP
IC2101
SUPPLY REEL SENSOR
IC2102
TAKE-UP REEL SENSOR
S REEL
T REEL
S2101
SAFETY TAB SW
S2102
CASSETTE UP/DOWN SW
FL/TAB
SENSOR [MWB]
REC (AUDIO)
LINE MUTE
PB
To AUDIO BLOCK
02Hr
To [Y/C]
48Hr
24Hr
12Hr
⚠ QF1901
250mA
REC9V
S9V
REC (VIDEO)
Q1924
V REC
CAPST CONT
fH CORRECT1
fH CORRECT2
SKEW
CTL CONT
REVERSE
CLK (S-SRV)
DATA (S-SRV)
POWER ON
SKEW2
Q1905
Q906
A5. 4V
To SERVO BLOCK
DS
Q1518
INV.
Q1519
SW
CTL
CTL DIV
SW25Hz
CTL DUTY
CFG DIV
Q931
From SERVO BLOCK
CFG/REV CFG
MAIN [MA]
A
B
C
D
E
1
2
3
4
5
6
7
8

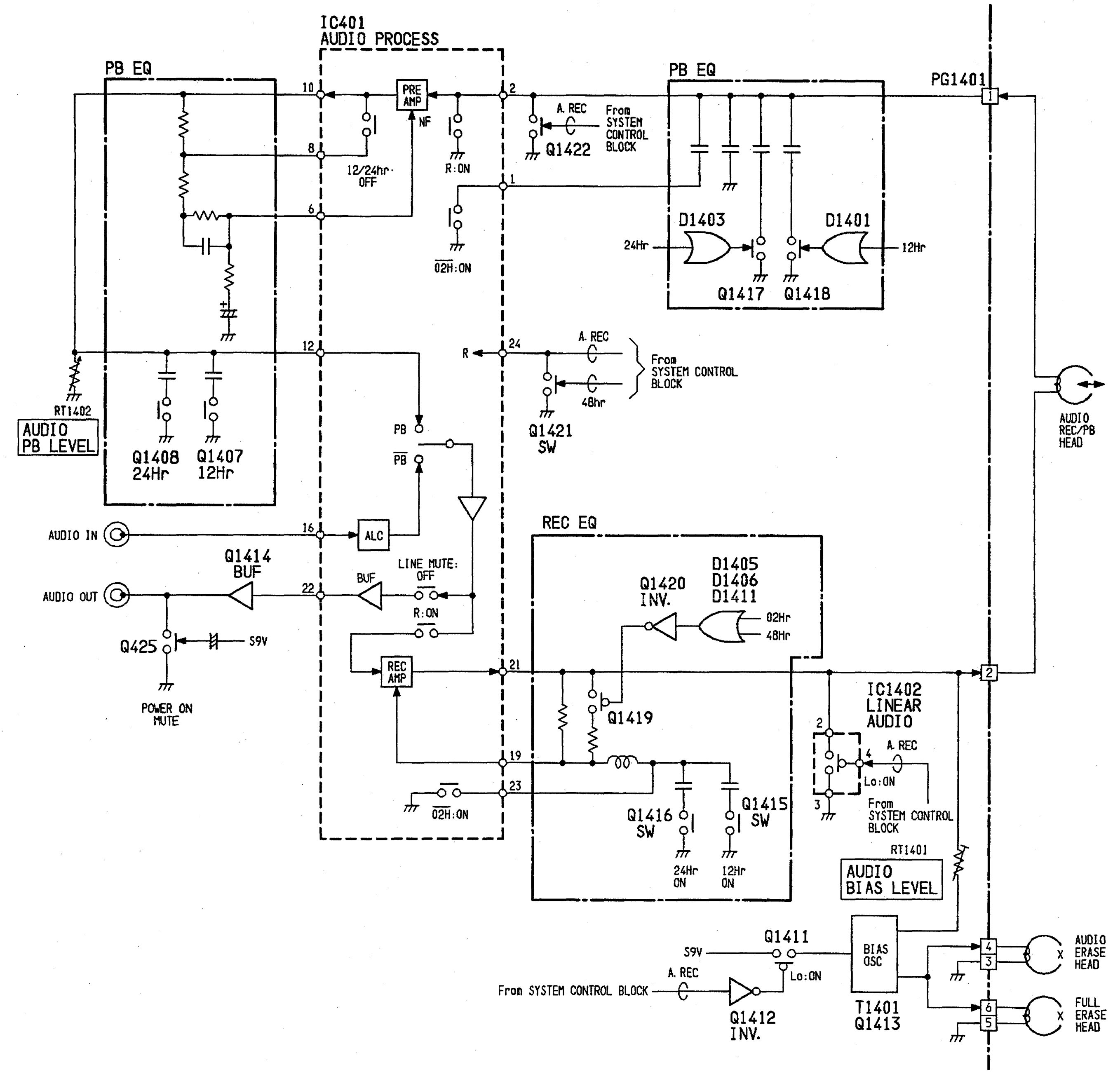
1-3. SERVO


CYLINDER MOTOR
IC01 CYLINDER MOTOR DRIVE
FG COIL
MOTOR DRIVE
MOTOR POSITION SENSOR AMP
TACH SENSOR
PG01
PG1608
CYL FG(-)
CYL FG(+)
IC1602 (2/2) FG AMP
IC1602 (1/2) FG AMP
D1608
D1607
A13 5V
D CONT
Q1618
SKEW2
SKEW
From SYSTEM CONTROL BLOCK
fH CORRECT1
fH CORRECT2
TACH PULSE
RT1601
S5V
SWITCHING POINT
To SYSTEM CONTROL BLOCK
To TIMELAPSE BLOCK
SW25Hz
To [PRE]
fsc
C SYNC
From [WYC]
V DRIVE
To [WYC]
CTL DUTY
CTL
C FG DIV
DATA (S-M S)
CLOCK (S-M S)
IC1601 MAIN SERVO
CYL. SPEED CONTROL
CAPSTAN SPEED CONTROL
CYL. SELECT
C.FG DIVIDER
SW25Hz GEN
CYL PHASE CONTROL
CAPSTAN PHASE CONTROL
TRACKING M M
REF25 GEN
V. SYNC SEPA
V. SYNC GEN
CTL DUTY
MODE OUTPUT
SERIAL INPUT
EACH STAGE
CTL DIVIDER
PB CTL AMP
PB:ON
IC1609
SP SLOW
IC1607 (2/2) SIGNAL SWITCH
CAPST CONT
FB
Q1611
Q1609
IC1605 12Hr~30Hr CAP. CONT.
CAP. SPEED CONT
CAP PHASE CONT
1/4
Q1624
Q1626
To TIMELAPSE BLOCK
45Hz
D1614
24Hr
12Hr
IC1608 SIGNAL SWITCH
To SYSTEM CONTROL BLOCK
IC1606 AMP
IC1607 (1/2) SIGNAL SWITCH
Q1607
Q1623
D1612
12Hr
24Hr
REVERSE
POWER ON
Q1637
Q1619
V REC
REC9V
IC1612
IC1613
D1609
D1604
Q1605
Q1604
Q1603
CTL CONT
D1605
PG1603
CONTROL HEAD
MAIN [MA]
PG1609
PG01M
IC01M CAPSTAN MOTOR DRIVE
C.FG SENSOR
V CAP
From [PUR]
MOTOR DRIVE
MOTOR POSITION SENSOR AMP
CAPSTAN MOTOR
U
V
W

1-4. Y/CHROMA


VIDEO IN
VIDEO OUT
PG1121
PG200
75
REA
Q1351
LPF
IC1351
AGC
SW
SYNC SEP
Q1358
BUF
Q1353 Q1354
CLAMP
BUF
IC1353
SYNC SEPA.
IC1352
CHARA. GEN
VIDEO IN
VIDEO OUT
DATA (M-CG)
H SYNC
V SYNC
To TIMELAPSE BLOCK
From TIMELAPSE BLOCK
Q1352
MA
PG1521
PG206
IC201
Y PROCESS
EMPH
FM MOD
3MHz LPF
FM DEMOD
DOC
DE-EMPH
Y/C MIX
6db AMP
PB
4MHz LPF
3.5MHz LPF
IC206
LPF SELECT
BUF
L
H
MONO
CP201
Q312
IC302
PHASE COMPENSATOR
CP303
2H COMB
IC301
CHROMA PROCESS
CONV
PB AMP
1.3MHz LPF
L307~9 C317, 18 20
CP302
4.43MHz BPF
1.6MHz LPF
WYC
D202
SW
(MONO ON)
1.4MHz HPF
CP205
AMP BUF
Q213, Q214
To SYSTEM CONTROL BLOCK
T PLAY
PG208
PG1524
REC Y
RT301
REC CHROMA LEVEL
Q311
Q211, Q212
PEAKING
REC C
PB Y
PB C
PG1503
REC (Y+C)
PG3
Q4
Q2
Q3
IC1
VIDEO HEAD AMP
VIDEO HEAD SW
PRE
PG1
SP 1CH
SP 2CH
EP 2CH
EP 1CH
MECHA. BLOCK
A
B
C
D
E
1
2
3
4
5
6
7
8

1-5. AUDIO


IC401
AUDIO PROCESS
PB EQ
PRE AMP
NF
12/24hr·OFF
R:ON
02H:ON
A. REC
From SYSTEM CONTROL BLOCK
Q1422
PG1401
D1403
D1401
24Hr
12Hr
Q1417
Q1418
RT1402
AUDIO PB LEVEL
Q1408 24Hr
Q1407 12Hr
R
48hr
Q1421 SW
AUDIO REC/PB HEAD
PB
PB
AUDIO IN
ALC
AUDIO OUT
Q1414 BUF
BUF
LINE MUTE: OFF
R:ON
Q425
S9V
POWER ON MUTE
REC AMP
REC EQ
Q1420 INV.
D1405
D1406
D1411
02Hr
48Hr
Q1419
02H:ON
Q1416 SW
Q1415 SW
24Hr ON
12Hr ON
IC1402 LINEAR AUDIO
A. REC
Lo:ON
From SYSTEM CONTROL BLOCK
RT1401
AUDIO BIAS LEVEL
Q1411
S9V
Lo:ON
From SYSTEM CONTROL BLOCK
Q1412 INV.
BIAS OSC
T1401
Q1413
AUDIO ERASE HEAD
FULL ERASE HEAD
10
8
6
12
16
22
2
1
24
21
19
23
2
4
3
1
2
4
3
6
5

E

D

C

B

A

1 2 3 4

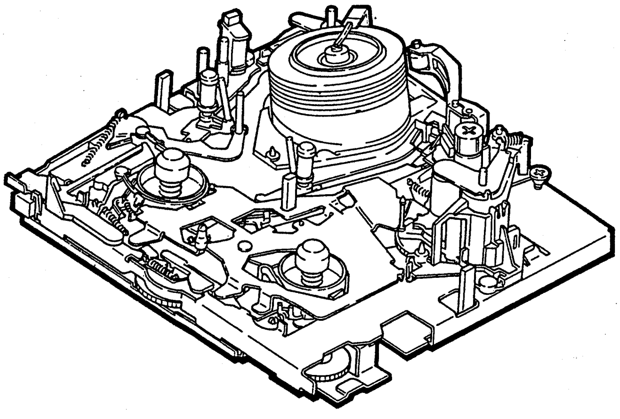
HITACHI

V01415

SERVICE MANUAL
Wartungsanleitung

TK No.4412E,G

AF Mechanism



VHS

This video desk is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

VHS

Dieser Video-Recorder entspricht dem VHS-Format. Für richtigen Betrieb müssen daher VHS-Magnetband-Cassetten verwendet werden.

Printed by: Schaltungsdienst Lange, Berlin (Germany)

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

Änderungen der Technischen Daten und Teile im Sinne ständiger Verbesserung vorbehalten.

VIDEO CASSETTE RECORDER
Video-Cassettenrecorder

July 1994 TOKAI Consumer Electronics Division

INHALTSVERZEICHNIS

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2. Prüfen des Betriebs in den einzelnen Modi G2-10
Entfernen des im Bandlaufwerk belassenen Cassette .. G2-11

KAPITEL 3 Wartung und Inspektion

1. Notwendigkeit von Wartung und Inspektion G3-1
2. Geplante Wartung und Inspektion G3-1
3. Bevor Versagen des Videorecorders festgestellt wird G3-1
4. Für Inspektion und Wartung erforderliche Werkzeuge G3-2
5. Reinigungsvorgang G3-2
6. Schmieren und Fetten G3-2
7. Zu wartende/prüfende Teile und Wartungs/Prüfungsplan G3-3

CHAPTER 4
EXPLODED VIEWS

CHASSIS (I) SECTION 4-1
CHASSIS (II) SECTION 4-2
CASSETTE LOADING MECHANISM SECTION 4-3

Demontagemethode

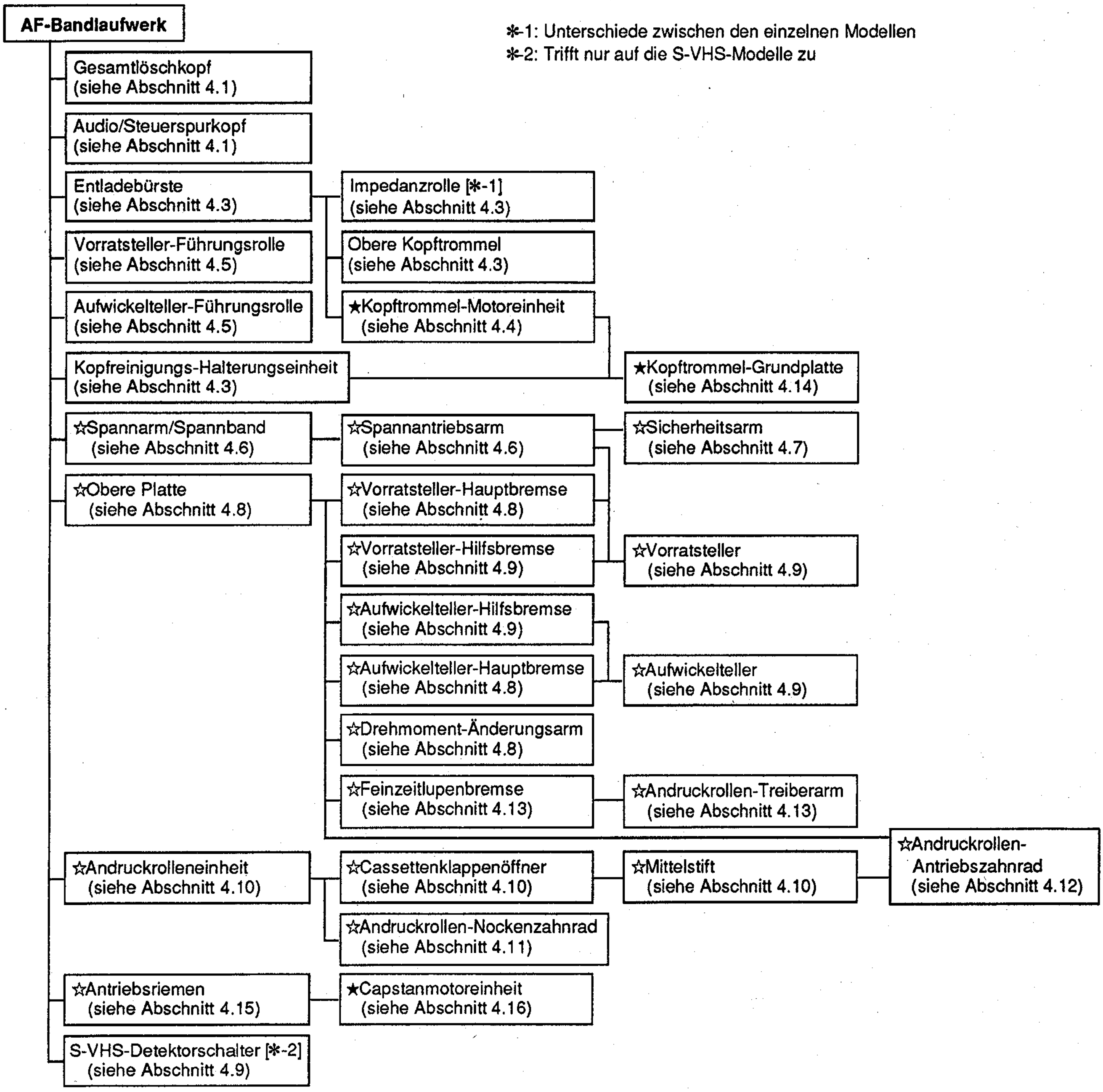
Zuerst das folgende "Teilehierarchiediagramm" beachten, wenn defekte Teile ausgetauscht werden. Diese Diagramm zeigt die Teileausbauvorgänge in der Hierarchie, in der die Teile auszutauschen sind.

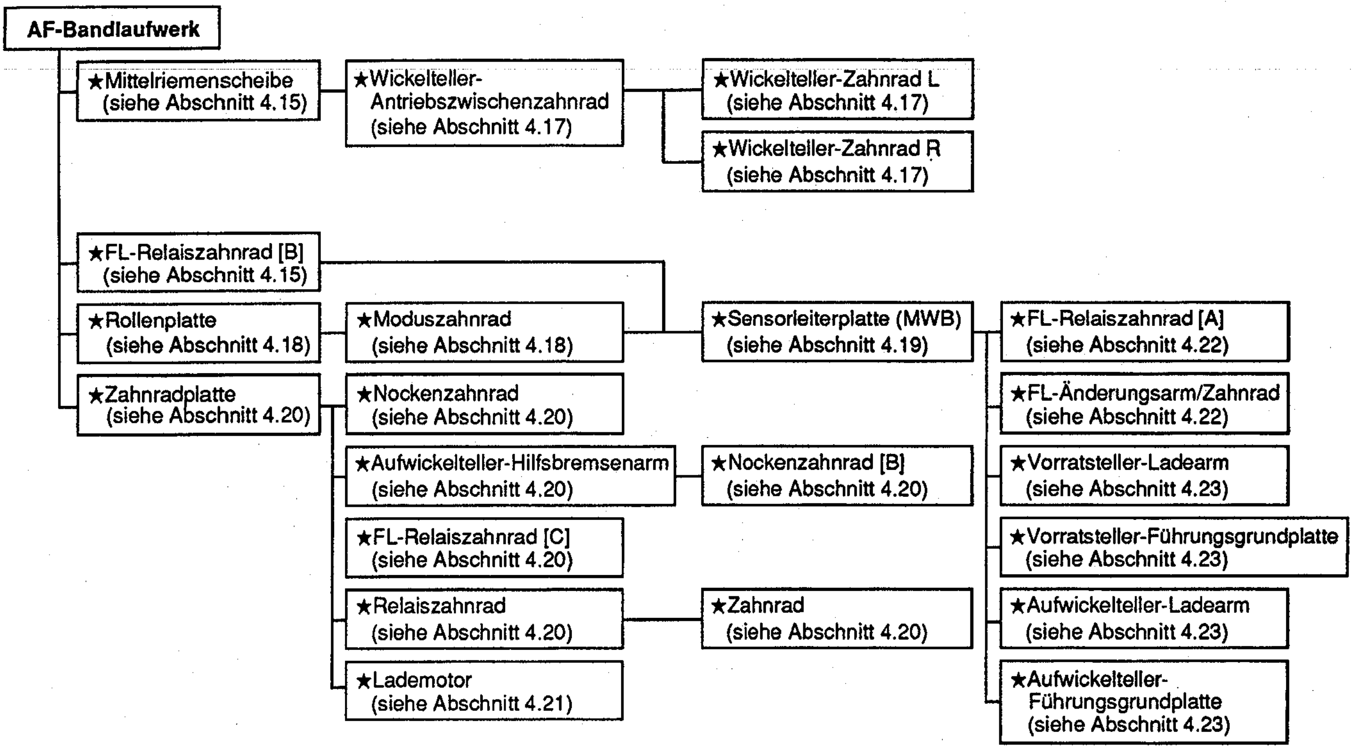
[Verwendung des Teilehierarchiediagramms]

(1) Das auszutauschende Teil in dem Diagramm aufsuchen.
(2) Das Teil in der Rangfolge über dem Auszutauschenden Teil überprüfen und danach mit der Demontage beginnen.
(3) Das defekte Teil erneuern und durch sinngemäße Umkehr der im Hierarchiediagramm aufgeführten Vorgänge einbauen.

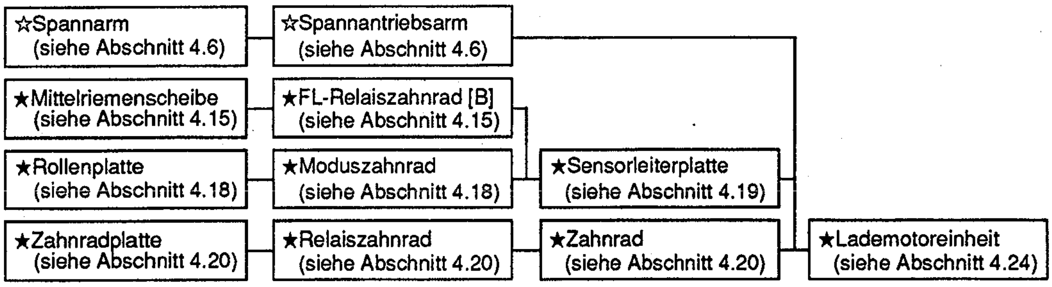
[Teilehierarchiediagramm]

*-1: Unterschiede zwischen den einzelnen Modellen
*-2: Trifft nur auf die S-VHS-Modelle zu


AF-Bandlaufwerk
Gesamtlöschkopf (siehe Abschnitt 4.1)
Audio/Steuerspurkopf (siehe Abschnitt 4.1)
Entladebürste (siehe Abschnitt 4.3)
Impedanzrolle [*-1] (siehe Abschnitt 4.3)
Vorratsteller-Führungsrolle (siehe Abschnitt 4.5)
Obere Kopftrommel (siehe Abschnitt 4.3)
Aufwickelteller-Führungsrolle (siehe Abschnitt 4.5)
★Kopftrommel-Motoreinheit (siehe Abschnitt 4.4)
Kopfreinigungs-Halterungseinheit (siehe Abschnitt 4.3)
★Kopftrommel-Grundplatte (siehe Abschnitt 4.14)
☆Spannarm/Spannband (siehe Abschnitt 4.6)
☆Spannantriebsarm (siehe Abschnitt 4.6)
☆Sicherheitsarm (siehe Abschnitt 4.7)
☆Obere Platte (siehe Abschnitt 4.8)
☆Vorratsteller-Hauptbremse (siehe Abschnitt 4.8)
☆Vorratsteller-Hilfsbremse (siehe Abschnitt 4.9)
☆Vorratsteller (siehe Abschnitt 4.9)
☆Aufwickelteller-Hilfsbremse (siehe Abschnitt 4.9)
☆Aufwickelteller-Hauptbremse (siehe Abschnitt 4.8)
☆Aufwickelteller (siehe Abschnitt 4.9)
☆Drehmoment-Änderungsarm (siehe Abschnitt 4.8)
☆Feinzeitlupenbremse (siehe Abschnitt 4.13)
☆Andruckrollen-Treiberarm (siehe Abschnitt 4.13)
☆Andruckrollen-Antriebszahnrad (siehe Abschnitt 4.12)
☆Andruckrolleneinheit (siehe Abschnitt 4.10)
☆Cassettenklappenöffner (siehe Abschnitt 4.10)
☆Mittelstift (siehe Abschnitt 4.10)
☆Andruckrollen-Nockenzahnrad (siehe Abschnitt 4.11)
☆Antriebsriemen (siehe Abschnitt 4.15)
★Capstanmotoreinheit (siehe Abschnitt 4.16)
S-VHS-Detektorschalter [*-2] (siehe Abschnitt 4.9)


AF-Bandlaufwerk
★Mittelriemenscheibe (siehe Abschnitt 4.15)
★Wickelteller-Antriebszwischenzahnrad (siehe Abschnitt 4.17)
★Wickelteller-Zahnrad L (siehe Abschnitt 4.17)
★Wickelteller-Zahnrad R (siehe Abschnitt 4.17)
★FL-Relaiszahnrad [B] (siehe Abschnitt 4.15)
★Rollenplatte (siehe Abschnitt 4.18)
★Moduszahnrad (siehe Abschnitt 4.18)
★Sensorleiterplatte (MWB) (siehe Abschnitt 4.19)
★FL-Relaiszahnrad [A] (siehe Abschnitt 4.22)
★FL-Änderungsarm/Zahnrad (siehe Abschnitt 4.22)
★Vorratsteller-Ladearm (siehe Abschnitt 4.23)
★Vorratsteller-Führungsgrundplatte (siehe Abschnitt 4.23)
★Aufwickelteller-Ladearm (siehe Abschnitt 4.23)
★Aufwickelteller-Führungsgrundplatte (siehe Abschnitt 4.23)
★Zahnradplatte (siehe Abschnitt 4.20)
★Nockenzahnrad (siehe Abschnitt 4.20)
★Aufwickelteller-Hilfsbremsenarm (siehe Abschnitt 4.20)
★Nockenzahnrad [B] (siehe Abschnitt 4.20)
★FL-Relaiszahnrad [C] (siehe Abschnitt 4.20)
★Relaiszahnrad (siehe Abschnitt 4.20)
★Zahnrad (siehe Abschnitt 4.20)
★Lademotor (siehe Abschnitt 4.21)

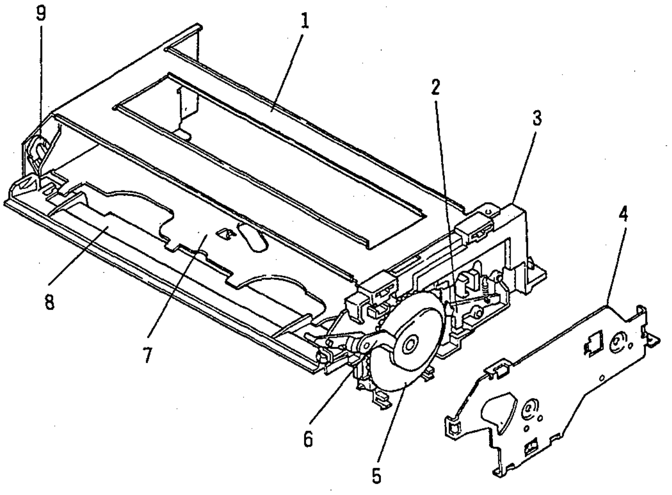
◆ **Bei Demontage der Lademotoreinheit:**


☆Spannarm (siehe Abschnitt 4.6)
☆Spannantriebsarm (siehe Abschnitt 4.6)
★Mittelriemenscheibe (siehe Abschnitt 4.15)
★FL-Relaiszahnrad [B] (siehe Abschnitt 4.15)
★Rollenplatte (siehe Abschnitt 4.18)
★Moduszahnrad (siehe Abschnitt 4.18)
★Sensorleiterplatte (siehe Abschnitt 4.19)
★Zahnradplatte (siehe Abschnitt 4.20)
★Relaiszahnrad (siehe Abschnitt 4.20)
★Zahnrad (siehe Abschnitt 4.20)
★Lademotoreinheit (siehe Abschnitt 4.24)

◆ **Zusätzliche Erläuterung**

Die mit "☆" markierten Teile sind zu warten, wenn der Cassetten-Lademechanismus ausgebaut ist.
Die mit "★" markierten Teile bei aus dem Videorecorder ausgebautem AF-Bandlaufwerk oder bei geöffneter Leiterplatte an der Unterseite des AF-Bandlaufwerks warten. (✻-1)
Die Teile ohne Markierungen können nur ausgetauscht werden, wenn die obere Abdeckung entfernt ist.
Im folgenden Text sind die Teile in der Reihenfolge der in den Abbildungen aufgeführten Buchstaben (A, B, C ...) auszubauen.

1. Identifikation und Anordnung der Komponenten im Cassetten-Lademechanismus



1. Cassishalter
2. Schaltarm
3. Seitenchassis
4. Zahnradhalterung
5. FL-Zahnrad
6. Klappenarm
7. Cassettenhalter
8. Fronthalter
9. FL-Antriebsarm

Abb. 1-1 Cassettenlademechanismus

2. Ausbau des Cassettenlademechanismus

1. Cassettenlademechanismus

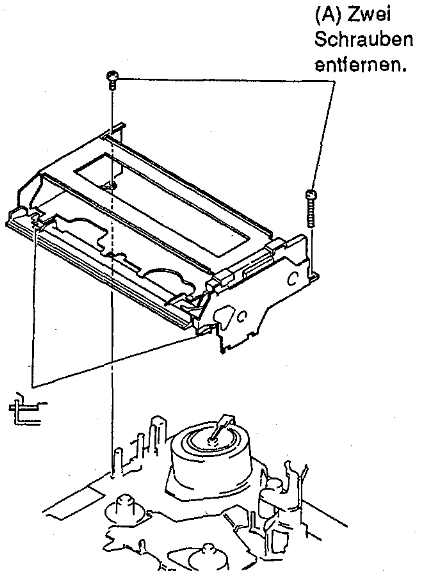

(A) Zwei Schrauben entfernen.

Abb. 2-1

2. Seitenzahnrad-Halterung, Chassishalter, FL-Antriebsarm, Cassettenhaltereinheit und Fronthalter

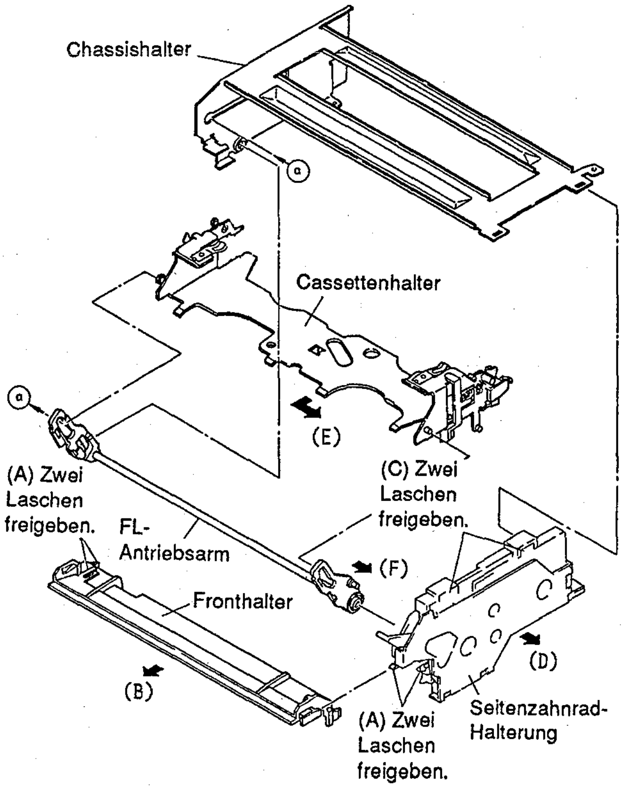

Chassishalter
a
Cassettenhalter
a
(E)
(A) Zwei Laschen freigeben.
FL-Antriebsarm
(C) Zwei Laschen freigeben.
(F)
Fronthalter
(D)
(B)
(A) Zwei Laschen freigeben.
Seitenzahnrad-Halterung

Abb. 2-2

◆ **Vorsichtsmaßnahmen beim Wiedereinbau**

1) Das Einsetzen der 6 Naben kontrollieren.
2) Darauf achten, daß die Bohrung (a) in der Seitenhalterung und die Bohrung in dem FL-Zahnrad [A] ausgerichtet sind.

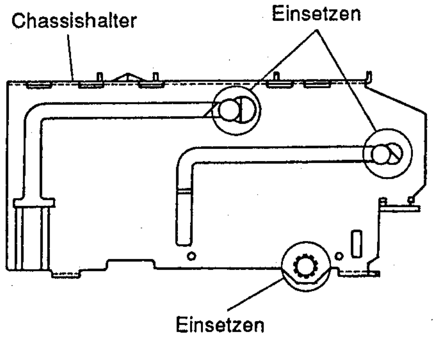

Chassishalter
Einsetzen
Einsetzen

Abb. 2-3

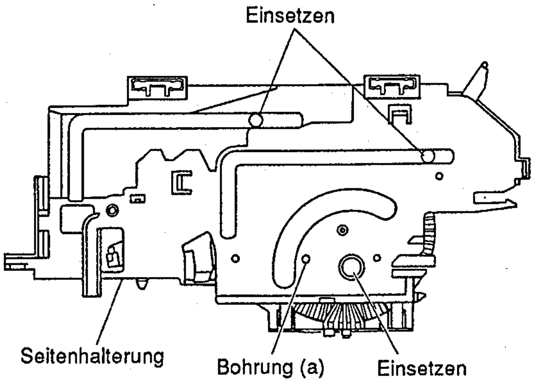

Einsetzen
Seitenhalterung
Bohrung (a)
Einsetzen

Abb. 2-4

3. Zahnradhalterung, Klappenarm, FL-Zahnräder [A], [B] und Schaltarm

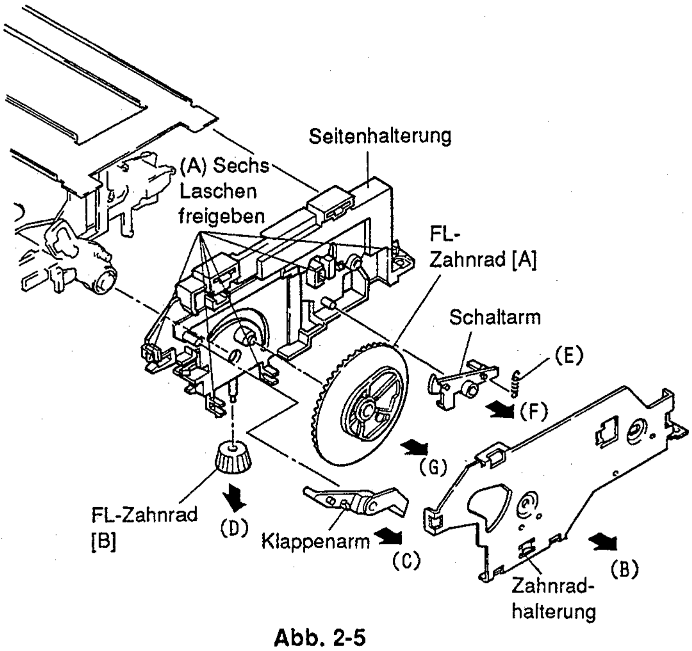

Seitenhalterung
(A) Sechs Laschen freigeben
FL-Zahnrad [A]
Schaltarm
(E)
(F)
(G)
FL-Zahnrad [B]
(D)
Klappenarm
(C)
(B)
Zahnrad-halterung

Abb. 2-5

◆ **Vorsichsmaßnahmen beim Wiedereinbau**

1) Wenn das FL-Zahnrad [A] wieder eingebaut wird, die Bohrung in dem FL-Zahnrad [A] und die Bohrung in der Seitenhalterung ausrichten.

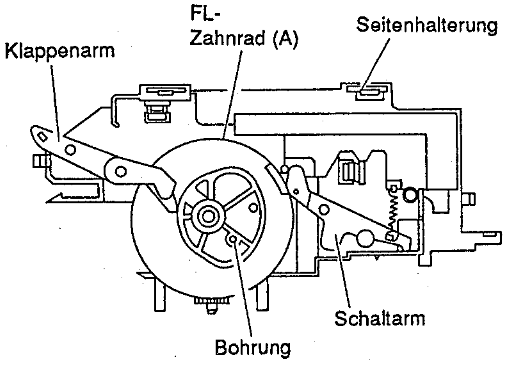
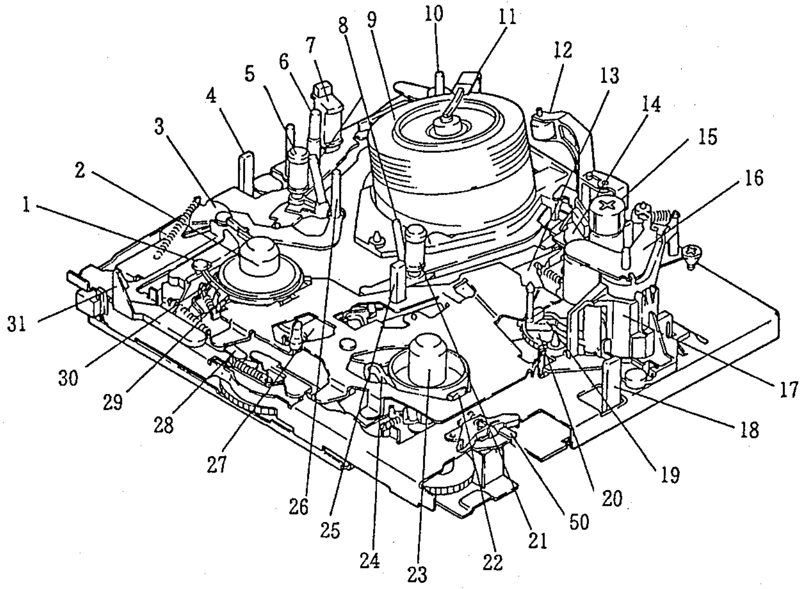

FL-Zahnrad (A)
Seitenhalterung
Klappenarm
Schaltarm
Bohrung

Abb. 2-6

3. Identifikation und Anordnung der Komponenten im AF-Bandlaufwerk



✻-1: Unterschiede zwischen den einzelnen Modellen

✻-2: Trifft nur auf die S-VHS-Modelle zu

Abb. 3-1 Drausicht auf das Bandlaufwerk

1. Spannantriebsarm
2. Vorratsteller
3. Spannarm
4. Vorratsteller-Bandendensensor
5. Vorratsteller-Führungsrolle
6. Vorratsteller-Führungsstift
7. Gesamtlöschkopf
8. Neigungsführung
9. Kopftrommelmotor
10. Impedanzrolle [✻-1]
11. Statische Entladebürste
12. Kopfreinigungsarmeinheit
13. Feinzeitlupen-Bremsenarm
14. Audio/Steuerspurkopf
15. Capstanwellenhalter
16. Andruckrolleneinheit
17. Cassettenklappenöffner
18. Aufwickelteller-Bandendensensor
19. Mittelstift
20. Andruckrollen-Antriebszahnrad
21. Aufwickelteller-Fügrungsrolle
22. Aufwickelteller-Hilfsbremse
23. Aufwickelteller
24. Aufwickelteller-Hauptbremse
25. Bandenden-LED
26. Spannstift
27. Drehmoment-Wechselarm
28. Vorratsteller-Hauptbremse
29. Vorratsteller-Hilfsbremse
30. Spannbandeinheit
31. Sicherheitsarm

50. S-VHS-Detektorschalter [✻-2]

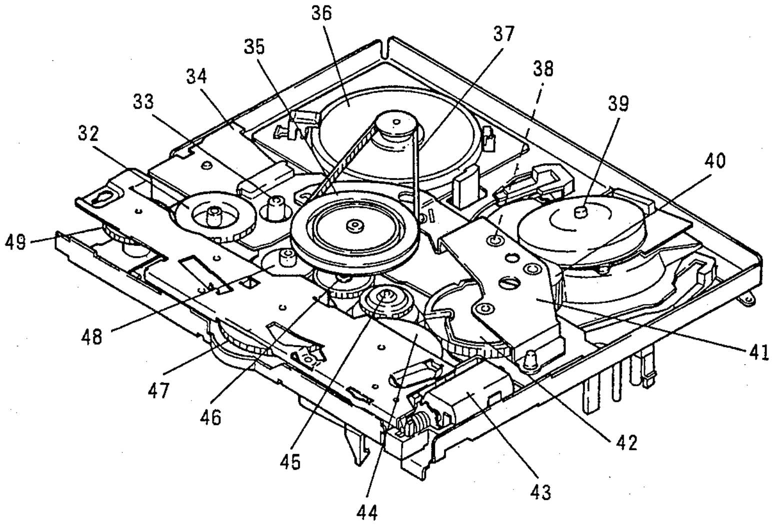


Abb. 3-2 Bodenansicht des Bandlaufwerks

32. FL-Zwischenzahnrad [B]
33. FL-Zwischenzahnrad [A]
34. Sensorleiterplatte (MWB)
35. Mittelriemenscheibe
36. Captsanmotoreinheit
37. Antriebsriemen
38. Aufwickelteller-Ladezahnrad
39. Kopftrommelmotoreinheit
40. Vorratsteller-Ladezahnrad
41. Rollenplatte
42. Moduszahnrad
43. Lademotor
44. Nockenzahnrad [A]
45. Wickelteller-Zahnrad L
46. Wickelteller-Antriebszwischenrad
47. Nockenzahnrad [B]
48. Wickelteller-Zahnrad R
49. FL-Zwischenzahnrad [C]

4. Ausbau der Komponenten

1. Gesamtlöschkopf

◆ **Vorsichtsmaßnahmen beim Wiedereinbau**

1) Die Oberfläche des Gesamtlöschkopfes und des Vorratsteller-Führungsstiftes, die mit dem Band in Kontakt ist, sauber halten.

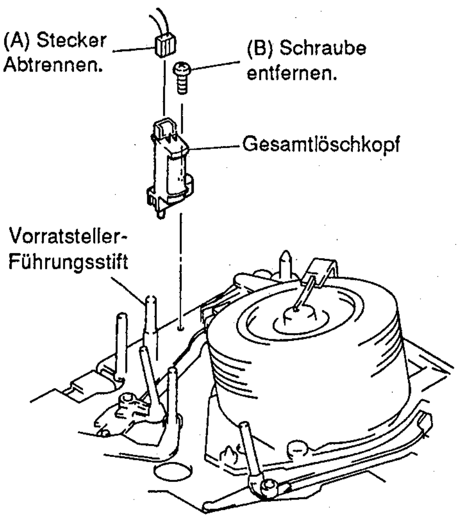

(A) Stecker Abtrennen.
(B) Schraube entfernen.
Gesamtlöschkopf
Vorratsteller-Führungsstift

Abb. 4-1

2. Audio/Steuerspurkopf

◆ **Vorsichtsmaßnahmen beim Wiedereinbau**

1) Die Unterseite der Feder unter der Kopfgrundplatte an dem Chassis und die Oberseite an dem Anschlag der Kopfgrundplatte einhängen.
2) Die Oberfläche des Audio/Steuerspurkopfes, die mit dem Band in Kontakt ist, sauber halten.

◆ **Mechanische Einstellung nach dem Wiedereinbau**

1) Einstellung des Audio/Steuerspurkopfes (A/C)

◆ **Elektrische Einstellungen nach dem Wiedereinbau**

1) X-Wert-Einstellung
2) Einstellung des Audio-Vormagnetisierungspegels

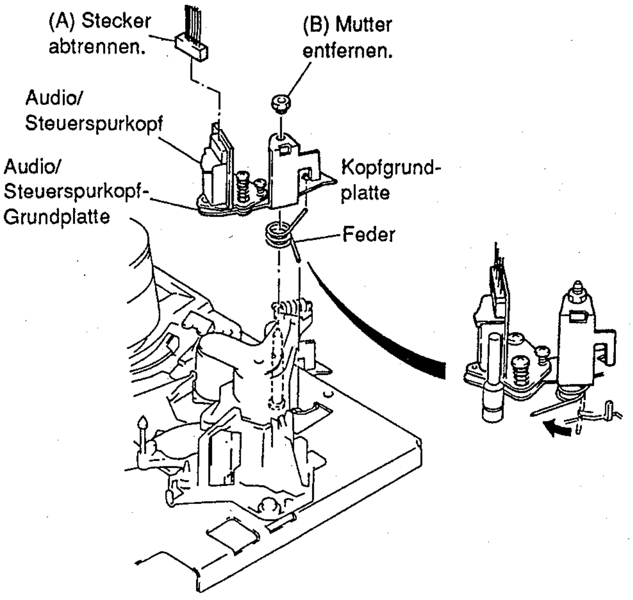

(A) Stecker abtrennen.
(B) Mutter entfernen.
Audio/ Steuerspurkopf
Audio/ Steuerspurkopf-Grundplatte
Kopfgrund-platte
Feder

Abb. 4-2

3. Obere Kopftrommel (Video-Köpfe) und Kopfreinigungs-Halterungseinheit

◆ **Vorsichtsmaßnahmen während der Arbeiten**

1) Die obere Kopftrommel vertikal zur Kopftrommel-Einbaurichtung herausziehen.
2) Die Video-Kopfspitzen nicht berühren.

◆ **Vorsichtsmaßnahmen beim Wiedereinbau**

1) Die Bohrung in der oberen Kopftrommel auf den Stift der unteren Kopftrommel aufschieben.
2) Die beiden Befestigungsschrauben der oberen Kopftrommel abwechselnd festziehen.

◆ **Mechanische Einstellung nach dem Wiedereinbau**

1) Einstellung nach dem Austausch der Kopftrommel.

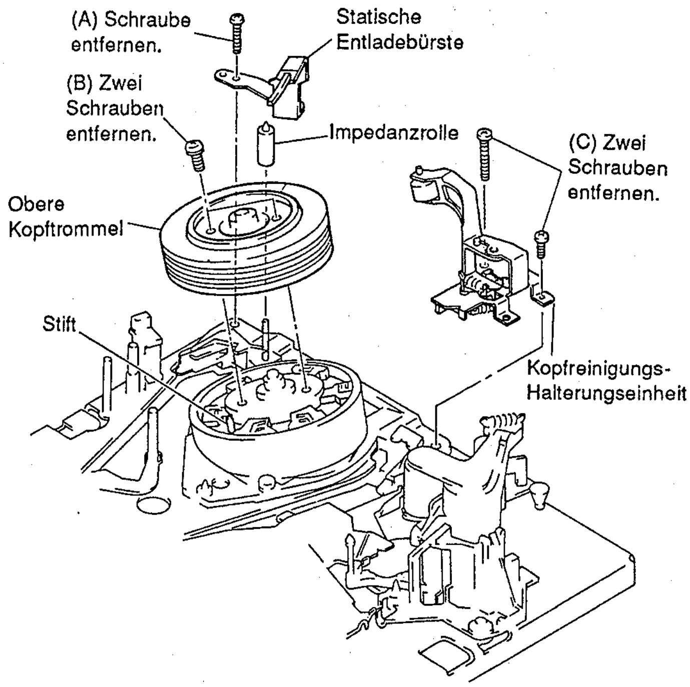

(A) Schraube entfernen.
Statische Entladebürste
(B) Zwei Schrauben entfernen.
Impedanzrolle
(C) Zwei Schrauben entfernen.
Obere Kopftrommel
Stift
Kopfreinigungs-Halterungseinheit

Abb. 4-3

4. Kopftrommelmotoreinheit

◆ **Vorsichtsmaßnahmen während der Arbeiten**

1) Die Videokopfspitzen nicht berühren.

◆ **Mechanische Einstellung nach dem Wiedereinbau**

1) Einstellung nach dem Austausch der Kopftrommel.

[Draufsicht]

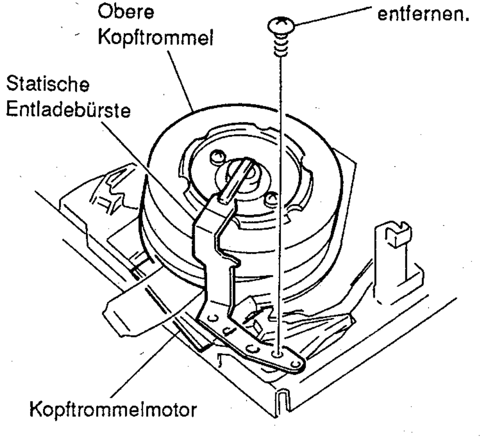

(A) Schraube entfernen.
Obere Kopftrommel
Statische Entladebürste
Kopftrommelmotor

Abb. 4-4 (1)

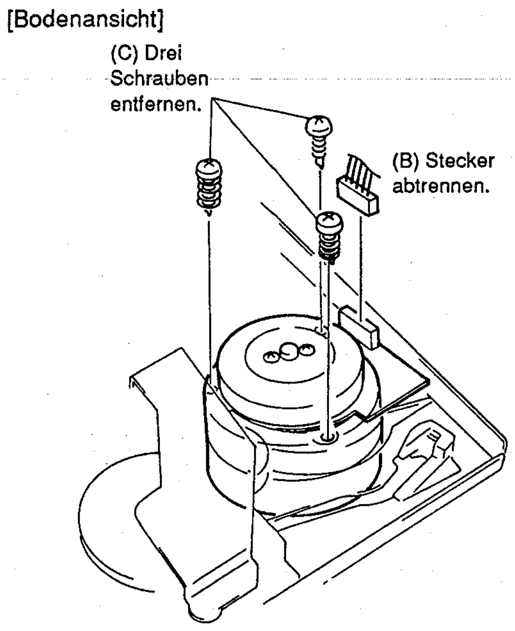

[Bodenansicht]
(C) Drei Schrauben entfernen.
(B) Stecker abtrennen.

Abb. 4-4 (2)

5. Vorratsteller/Aufwickelteller-Führungsrollen

◆ **Vorsichtmaßnahme beim Wiedereinbau**

1) Die Oberfläche der Führungsrolle, die in Kontakt mit dem Band ist, sauber halten.

◆ **Mechanische Einstellung nach dem Wiedereinbau**

1) Einstellung der Führungsrollenhöhe.

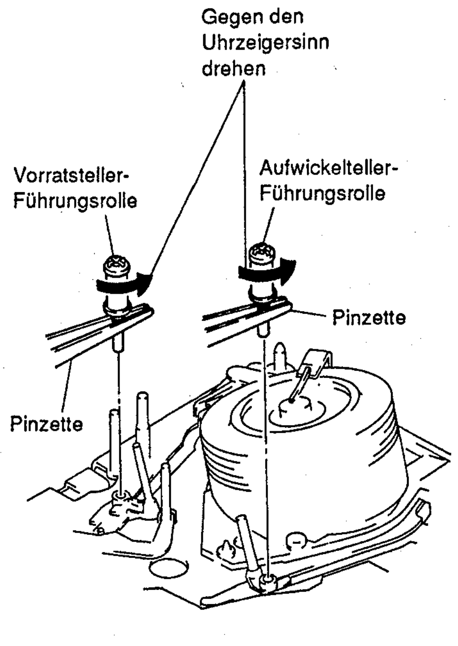

Gegen den Uhrzeigersinn drehen
Vorratsteller-Führungsrolle
Aufwickelteller-Führungsrolle
Pinzette
Pinzette

Abb. 4-5

6. Spannarm, Spannband und Spannantriebsarm

◆ **Vorsichtsmaßnahmen beim Wiedereinbau**

1) Die Oberfläche des Spannstiftes, die in Kontakt mit dem Band ist, sauber halten.
2) Die Nabe dieses Arms in die Nut des Nockenzahnrades [A] einsetzen (siehe Abschnitt 4-6).

◆ **Mechanische Einstellung nach dem Wiedereinbau**

1) Einstellung der Spannstiftposition und der Spannung.

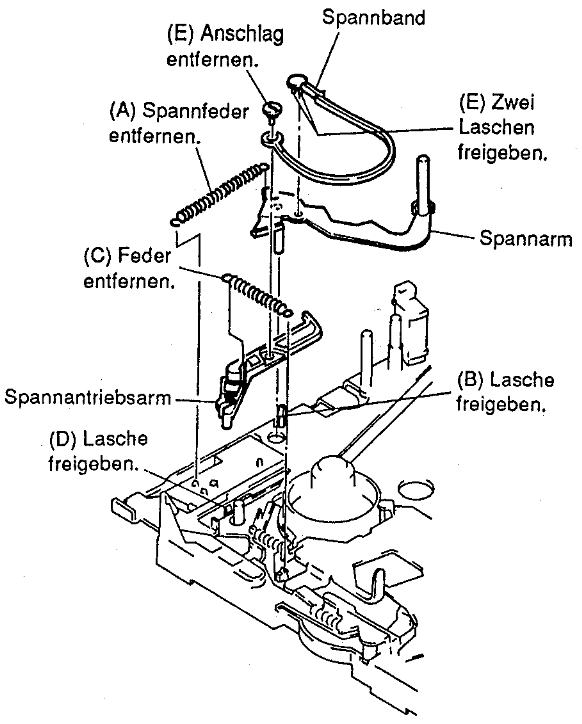

(E) Anschlag entfernen.
Spannband
(A) Spannfeder entfernen.
(E) Zwei Laschen freigeben.
Spannarm
(C) Feder entfernen.
Spannantriebsarm
(B) Lasche freigeben.
(D) Lasche freigeben.

Abb. 4-6

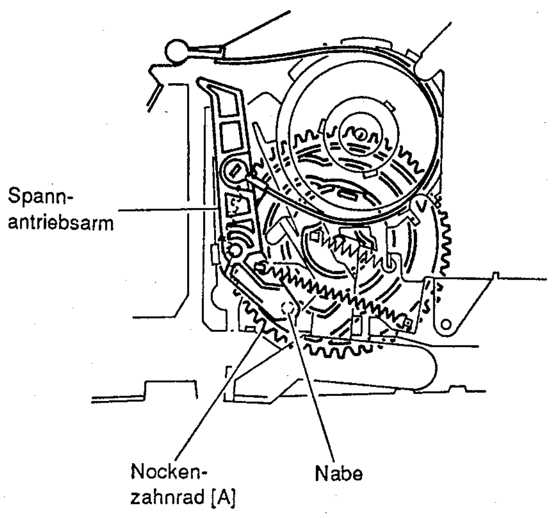

Spann-antriebsarm
Nocken-zahnrad [A]
Nabe

Abb. 4-7

7. Sicherheitsarm

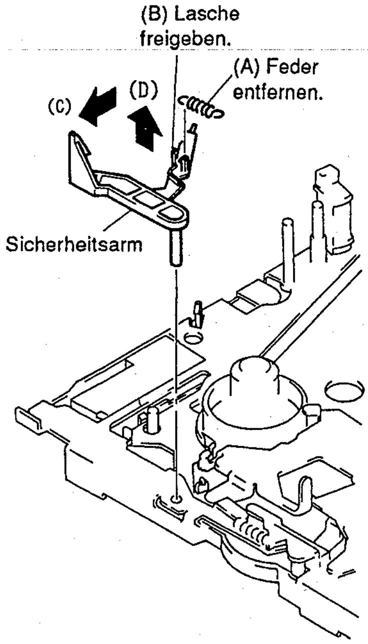

(B) Lasche
freigeben.
(A) Feder
entfernen.
(C)
(D)
Sicherheitsarm

Abb. 4-8

8. Obere Platte, Drehmoment-Wechselarm und Vorratsteller/Aufwickelteller-Hauptbremsen

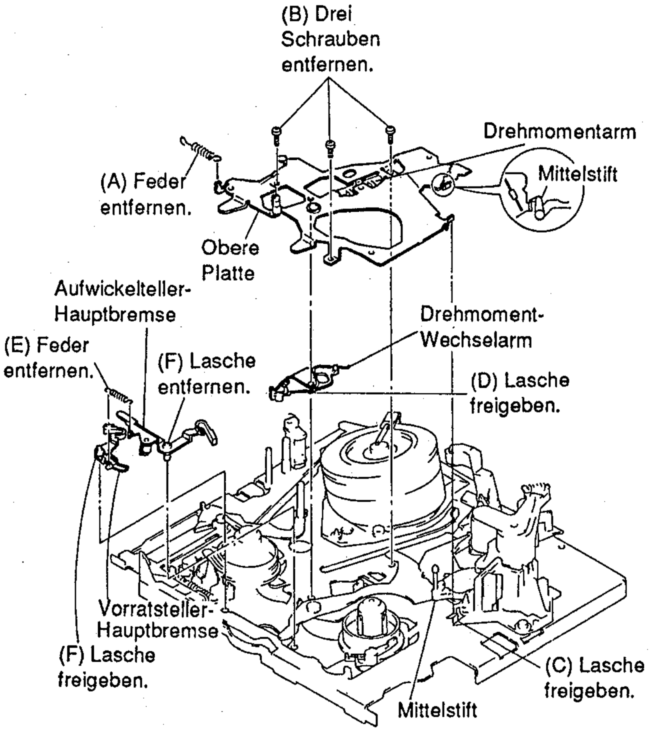

(B) Drei
Schrauben
entfernen.
Drehmomentarm
(A) Feder
entfernen.
Mittelstift
Obere
Platte
Aufwickelteller-
Hauptbremse
Drehmoment-
Wechselarm
(E) Feder
entfernen.
(F) Lasche
entfernen.
(D) Lasche
freigeben.
Vorratsteller-
Hauptbremse
(F) Lasche
freigeben.
Mittelstift
(C) Lasche
freigeben.

Abb. 4-9

[Einstellvorgang für Drehmomentarm]

1) Den Drehmomentarm gemäß Abbildung einsetzen.
2) Den Drehmomentarm an der oberen Platte anbringen, wie es in Abb. 4-10 dargestellt ist.
3) Den Drehmomentarm in die obere Platte einsetzen und dabei den Arm in Richtung des Pfeiles drehen.

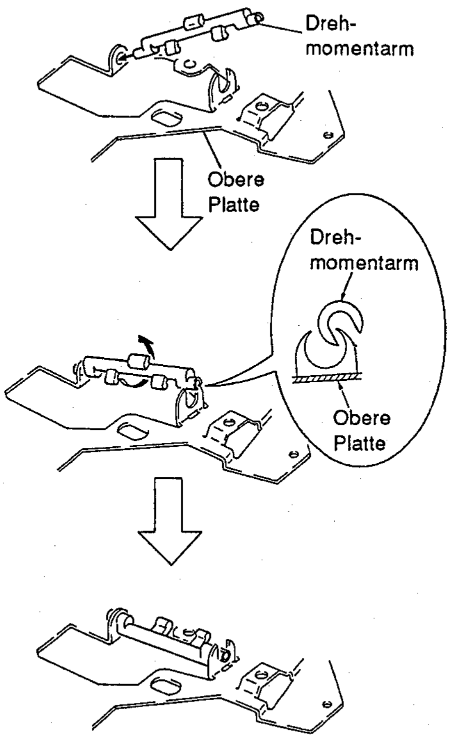

Dreh-
momentarm
Obere
Platte
Dreh-
momentarm
Obere
Platte

Abb. 4-10

9. Vorratsteller/Aufwickelteller, Vorratsteller/Aufwickelteller-Hilfsbremsen und S-VHS-Detektorschalter

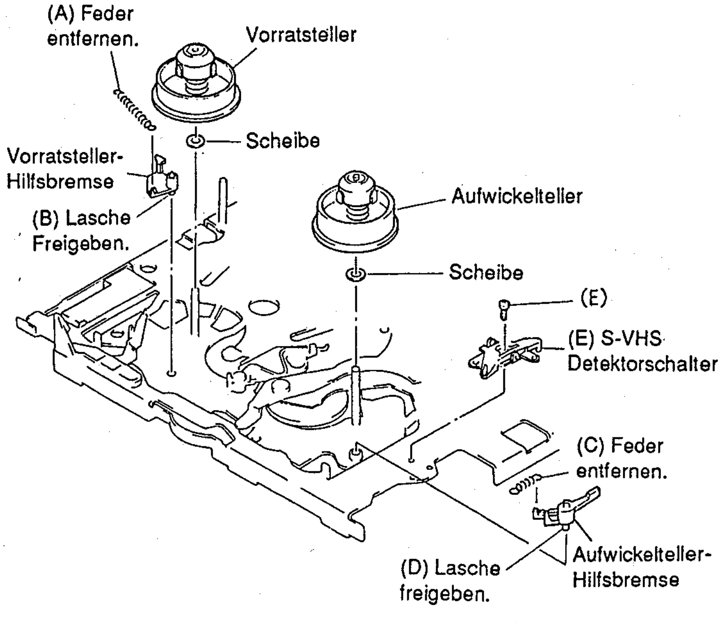

(A) Feder
entfernen.
Vorratsteller
Scheibe
Vorratsteller-
Hilfsbremse
(B) Lasche
Freigeben.
Aufwickelteller
Scheibe
(E)
(E) S-VHS
Detektorschalter
(C) Feder
entfernen.
(D) Lasche
freigeben.
Aufwickelteller-
Hilfsbremse

Abb. 4-11

10. Andruckrolleneinheit

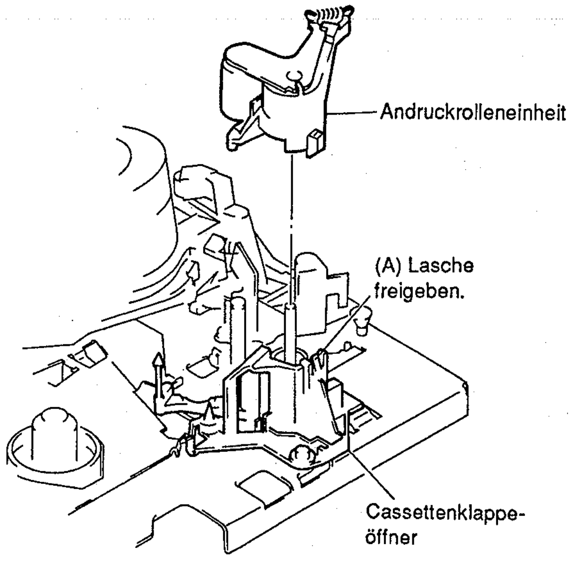

Andruckrolleneinheit
(A) Lasche freigeben.
Cassettenklappe-öffner

Abb. 4-12

11. Andruckrollen-Nockenzahnrad, Cassettenklappenöffner und Mittelstift

◆ Vorsichtsmaßnahmen beim Wiedereinbau

1) Die Oberfläche des Mittelstiftes, die mit dem Band in Kontakt ist, sauber halten.
2) Die Feder zwischen dem Mittelstift und dem Chassis einhängen.
3) Der Arm des Mittelstiftes sollte sich in der spezifizierten Position befinden.
4) Die Markierung (○) auf dem Andruckrollen-Nockenzahnrad und die Markierung (Δ) auf dem Andruckrollen-Antriebszahnrad ausrichten (siehe Abb. 4-16).

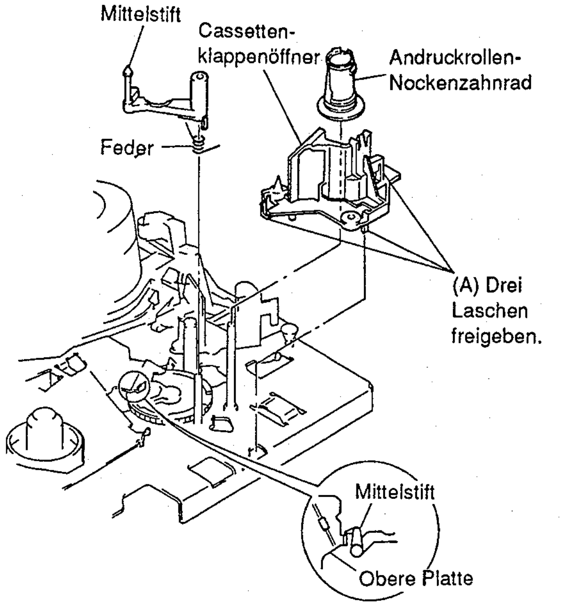

Mittelstift
Cassetten-klappenöffner
Andruckrollen-Nockenzahnrad
Feder
(A) Drei Laschen freigeben.
Mittelstift
Obere Platte

Abb. 4-13

12. Andruckrollen-Antriebszahnrad

◆ Vorsichtsmaßnahme beim Wiedereinbau

1) Die Bohrung (a) in dem Andrucksrollen-Antriebszahnrad und die Bohrung in dem Chassis ausrichten. Auch die Markierungen auf dem Antriebsrollen-Antriebszahnrad und dem Arm ausrichten.

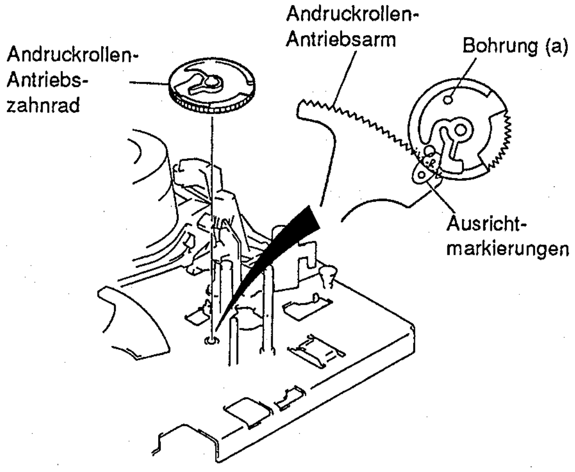

Andruckrollen-Antriebsarm
Andruckrollen-Antriebs-zahnrad
Bohrung (a)
Ausricht-markierungen

Abb. 4-14

13. Andruckrollen-Antriebsarm und Feinzeitlupen-Bremsenarm

◆ Vorsichtsmaßnahmen beim Wiedereinbau

1) Darauf achten, daß die Nabe des Andruckrollen-Antriebsarms richtig in die Nut des Nockenzahnrades [B] eingesetzt ist (siehe Abschnitt 4-16).
2) Die Bohrung (b) in dem Andruckrollen-Antriebsarm und die Bohrung in dem Chassis ausrichten (siehe Abb. 4-16).

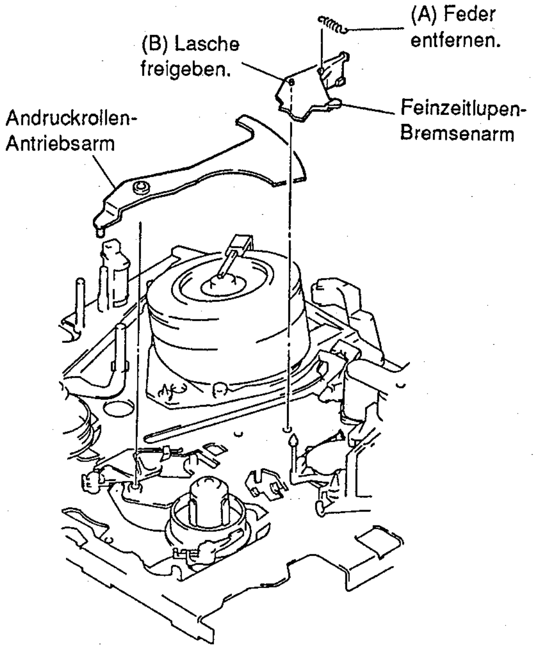

(A) Feder entfernen.
(B) Lasche freigeben.
Andruckrollen-Antriebsarm
Feinzeitlupen-Bremsenarm

Abb. 4-15

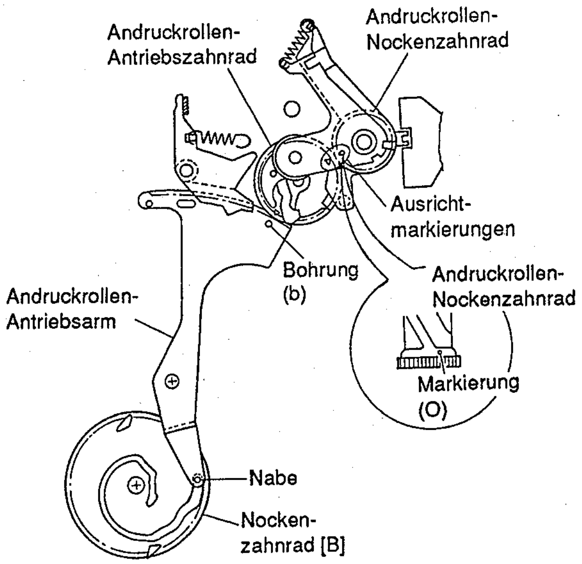

Andruckrollen-Antriebszahnrad
Andruckrollen-Nockenzahnrad
Ausricht-markierungen
Bohrung (b)
Andruckrollen-Nockenzahnrad
Andruckrollen-Antriebsarm
Markierung (O)
Nabe
Nocken-zahnrad [B]

Abb. 4-16

14. Kopftrommelmotor-Grundplatte

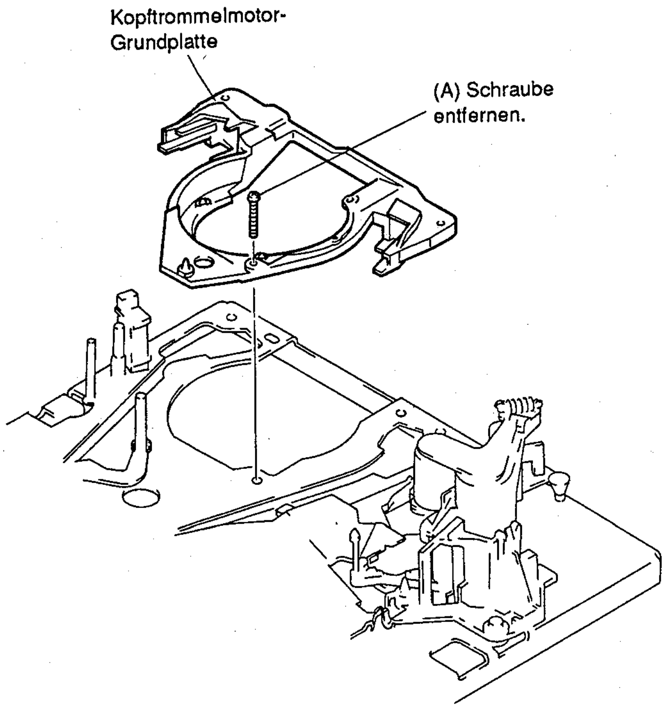

Kopftrommelmotor-Grundplatte
(A) Schraube entfernen.

Abb. 4-17

15. Antriebsriemen, Mittelriemenscheibe, FL-Zwischenzahnrad [B]

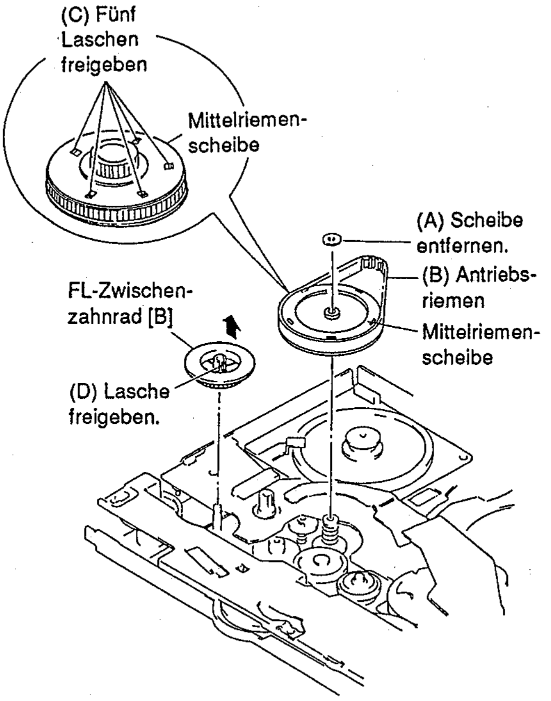

(C) Fünf Laschen freigeben
Mittelriemen-scheibe
(A) Scheibe entfernen.
(B) Antriebs-riemen
Mittelriemen-scheibe
FL-Zwischen-zahnrad [B]
(D) Lasche freigeben.

Abb. 4-18

16. Capstanmotoreinheit

◆ Vorsichtsmaßnahme beim Wiedereinbau

1) Die Oberfläche der Capstanwelle, die in Kontakt mit dem Band ist, sauber halten.

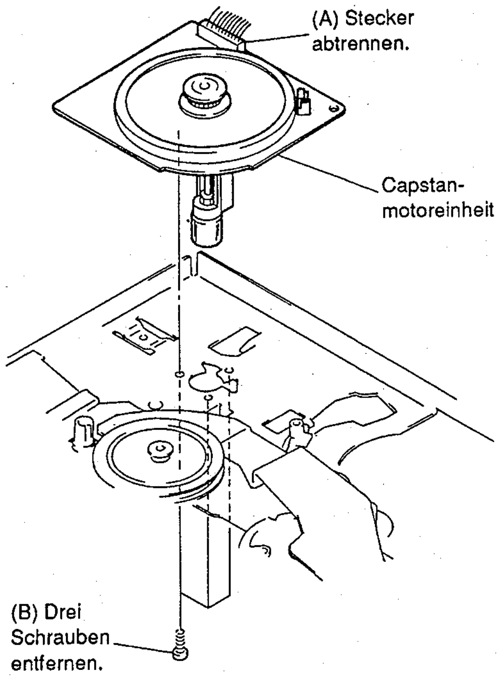

(A) Stecker abtrennen.
Capstan-motoreinheit
(B) Drei Schrauben entfernen.

Abb. 4-19

17. Wickelteller-Antriebszwischenzahnrad, Wickelteller-Zahnräder (L)/(R)

◆ Vorsichtsmaßnahme beim Wiedereinbau

1) Die Feder zwischen dem Zwischenzahnrad und der Scheibe einbauen.

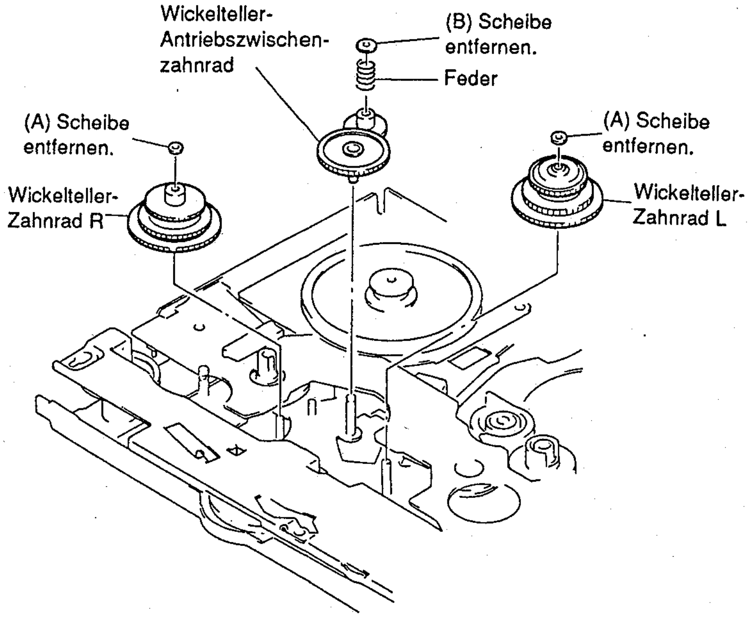

Wickelteller-Antriebszwischenzahnrad
(B) Scheibe entfernen.
Feder
(A) Scheibe entfernen.
(A) Scheibe entfernen.
Wickelteller-Zahnrad R
Wickelteller-Zahnrad L

Abb. 4-20

18. Rollenplatte, Moduszahnrad

◆ Vorsichtsmaßnahmen beim Wiedereinbau

1) Die Markierung (f) an dem Nockenzahnrad [A] und die Markierung (e) an dem Moduszahnrad ausrichten (Abb. 4-24).
2) Den Pfeil an der Sensorleiterplatte (MWB) und den Pfeil (Nr. 1) auf dem Bandlaufwerk-Statusschalter ausrichten (siehe Abb. 4-24).
3) Unter den obigen Bedingungen die Markierung (c) an dem Bandlaufwerk-Statusschalter und die Markierung (d) an dem Moduszahnrad ausrichten (siehe Abb. 4-24).

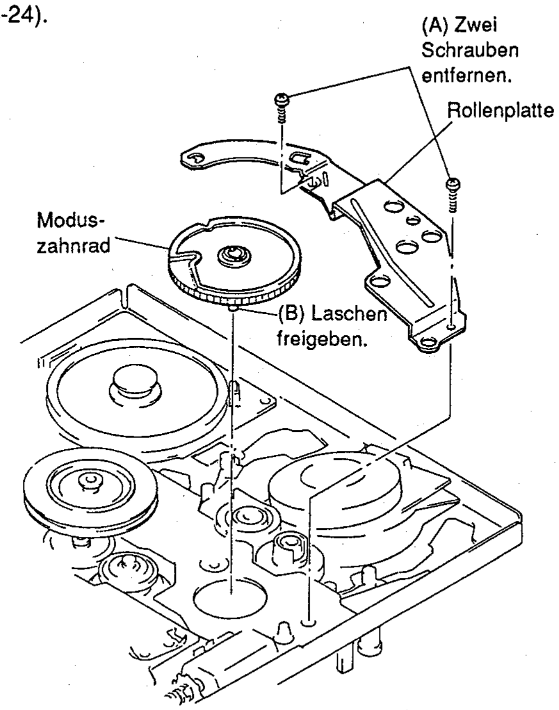

(A) Zwei Schrauben entfernen.
Rollenplatte
Moduszahnrad
(B) Laschen freigeben.

Abb. 4-21

19. Sensorleiterplatte (MWB)

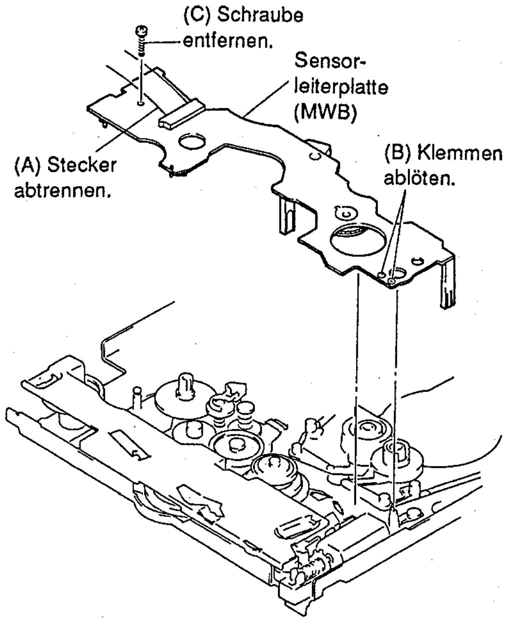

(C) Schraube entfernen.
Sensorleiterplatte (MWB)
(A) Stecker abtrennen.
(B) Klemmen ablöten.

Abb. 4-22

20. Zahnradplatte, Zwischenzahnrad, Zahnrad, Aufwickelteller-Bremsenhilfsarm, Verriegelungsarm, Zwischenzahnrad [C], Nockenzahnräder [A]/[B]

◆ Vorsichtsmaßnahmen beim Wiedereinbau

1) Die Bohrung (a) in dem Nockenzahnrad [A] und die Bohrung in dem Chassis ausrichten.
   Auch die Markierung (f) an dem Nockenzahnrad [A] und die Markierung (e) an dem Moduszahnrad ausrichten (siehe Abb. 4-24).
2) Die Markierung (h) auf dem Nockenzahnrad [B] und die Markierung (g) auf dem Nockenzahnrad [A] ausrichten (siehe Abb. 4-24).
3) Darauf achten, daß die Naben der Vorratsteller-Hilfsbremse und des Spannantriebsarms in den vorgeschriebenen Positionen eingesetzt sind (siehe Abb. 4-25).
4) Darauf achten, daß die Nabe des Andruckrollen-Antriebsarms in die Nut in dem Nockenzahnrad [B] eingesetzt ist (siehe Abb. 4-25).

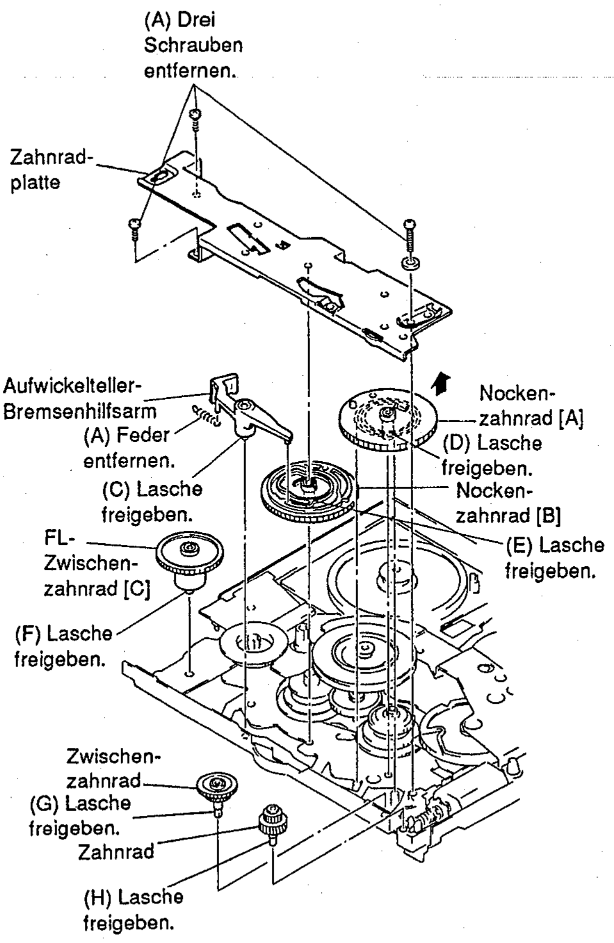

(A) Drei Schrauben entfernen.
Zahnradplatte
Aufwickelteller-Bremsenhilfsarm
(A) Feder entfernen.
(C) Lasche freigeben.
FL-Zwischenzahnrad [C]
(F) Lasche freigeben.
Nockenzahnrad [A]
(D) Lasche freigeben.
Nockenzahnrad [B]
(E) Lasche freigeben.
Zwischenzahnrad
(G) Lasche freigeben.
Zahnrad
(H) Lasche freigeben.

Abb. 4-23

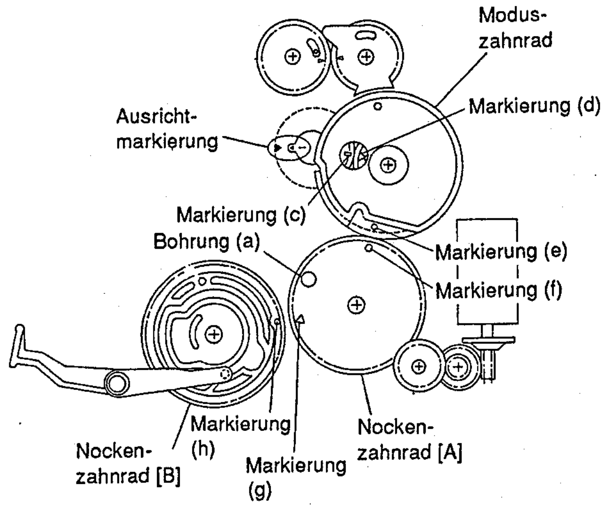

Moduszahnrad
Ausrichtmarkierung
Markierung (d)
Markierung (c)
Bohrung (a)
Markierung (e)
Markierung (f)
Nockenzahnrad [B]
Markierung (h)
Markierung (g)
Nockenzahnrad [A]

Abb. 4-24

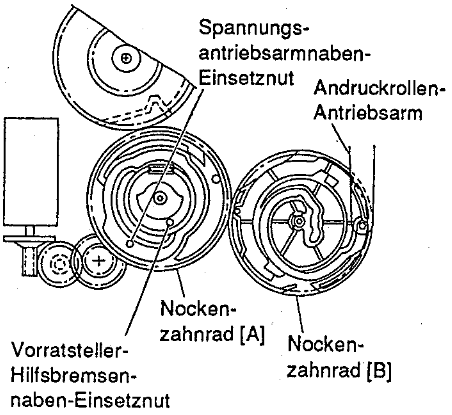

Spannungsantriebsarmnaben-Einsetznut
Andruckrollen-Antriebsarm
Nockenzahnrad [A]
Vorratsteller-Hilfsbremsennaben-Einsetznut
Nockenzahnrad [B]

Abb. 4-25

21. Lademotor und Lademotor-Zahnrad

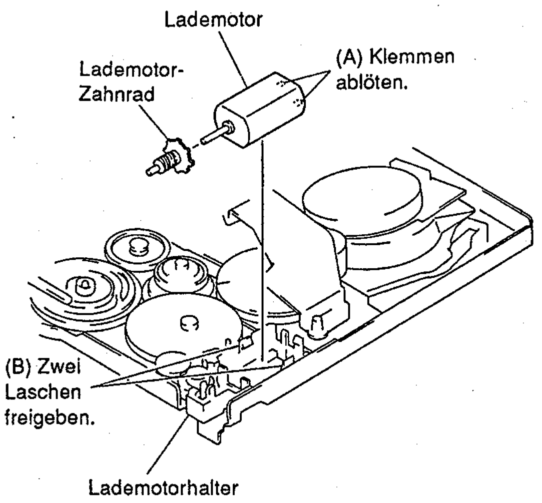

Lademotor
Lademotor-Zahnrad
(A) Klemmen ablöten.
(B) Zwei Laschen freigeben.
Lademotorhalter

Abb. 4-26

22. FL-Zwischenzahnrad [A], FL-Wechselarm, FL-Wechselzahnrad

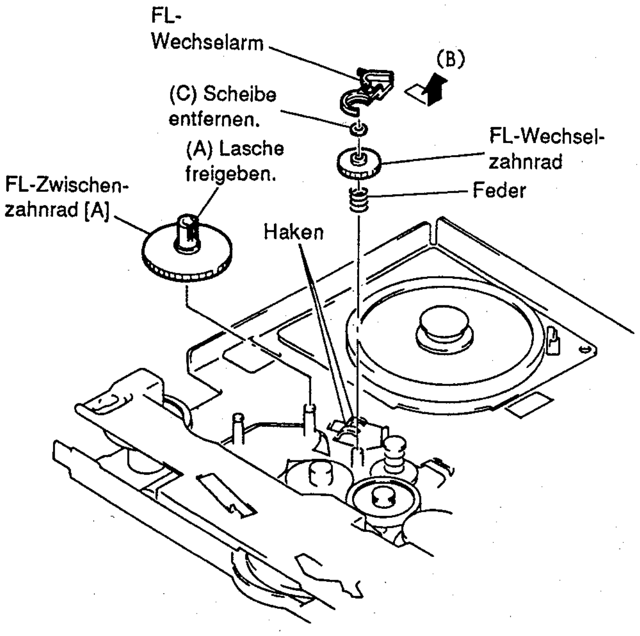

FL-Wechselarm
(B)
(C) Scheibe entfernen.
(A) Lasche freigeben.
FL-Wechselzahnrad
Feder
FL-Zwischenzahnrad [A]
Haken

Abb. 4-27

◆ **Vorsichtsmaßnahmen beim Wiedereinbau**

Den FL-Wechselarm gemäß nachfolgendem Vorgang einbauen. Den "U"-förmigen Abschnitt des Arms beim Einbau nicht verengen.

1) Den Arm seitlich anordnen und durch das Loch in dem Chassis einführen.
2) Den Arm nach vorne drehen (nach rechts).
3) Den gesamten Arm nach oben drücken, wobei darauf zu achten ist, daß der Abschnitt (a) des Arms nicht an dem Chassis anschlägt, und die Naben des Arms in die Bohrungen der Achsstütze des Chassis einsetzen.
4) Nach dem Einbau des Arms darauf achten, daß sich der Arm glatt bewegt.

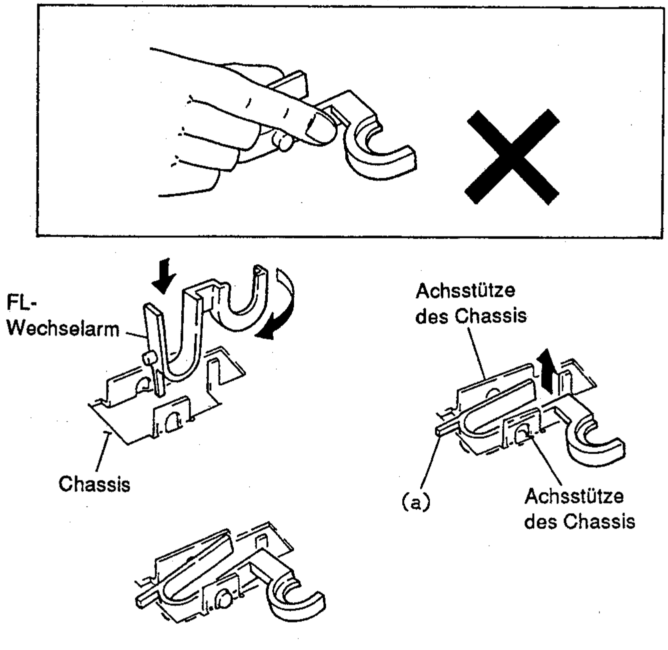

FL-Wechselarm
Chassis
Achsstütze des Chassis
(a)
Achsstütze des Chassis

Abb. 4-28

23. Vorratsteller/Aufwickelteller-Ladearme und Vorratsteller/Aufwickelteller-Führungsrollen-Grundplatten

◆ **Vorsichtsmaßnahmen beim Einbau**

1) Die Markierungen ausrichten (siehe Abb. 4-30).

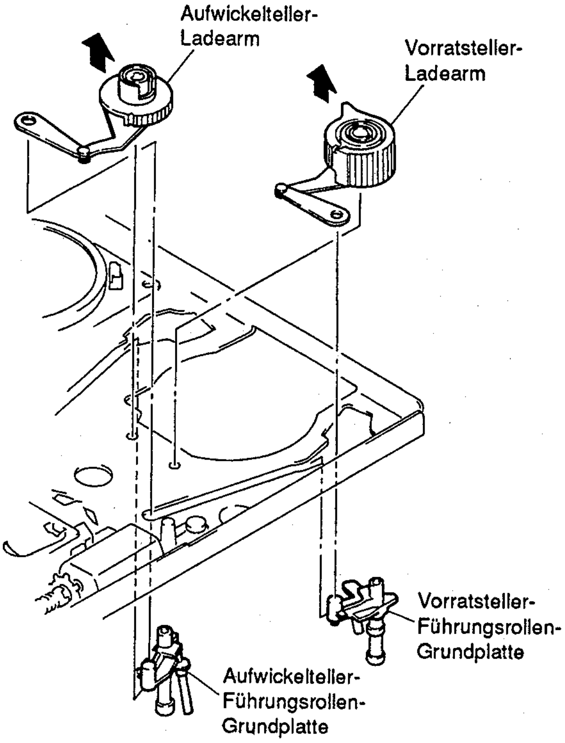

Aufwickelteller-Ladearm
Vorratsteller-Ladearm
Vorratsteller-Führungsrollen-Grundplatte
Aufwickelteller-Führungsrollen-Grundplatte

Abb. 4-29

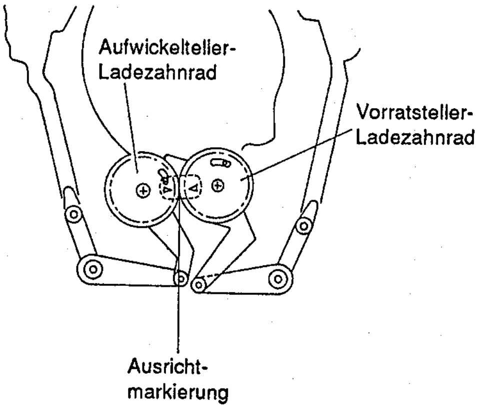

Aufwickelteller-Ladezahnrad
Vorratsteller-Ladezahnrad
Ausricht-markierung

Abb. 4-30

24. Lademotoreinheit

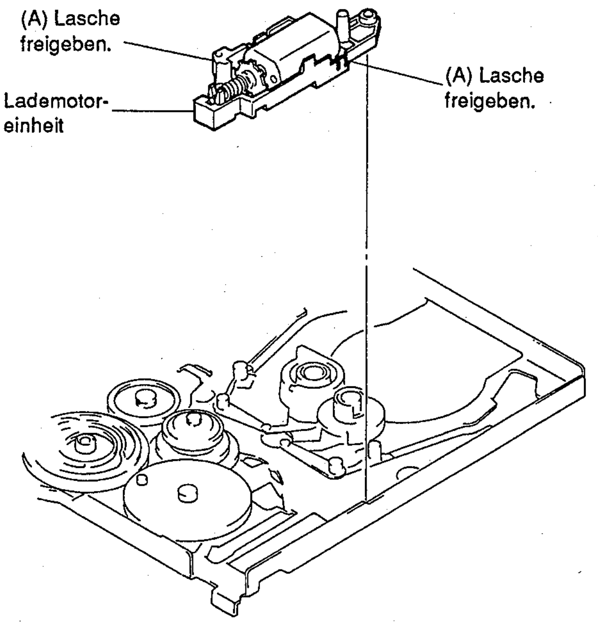
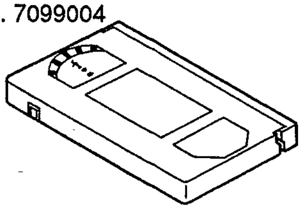
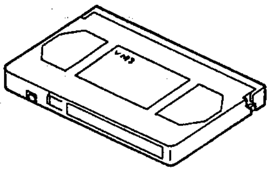
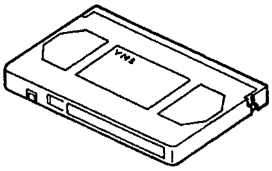
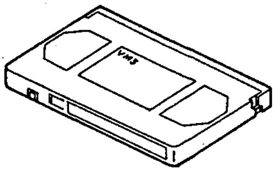
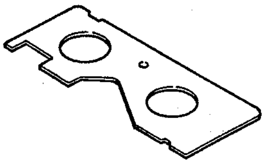
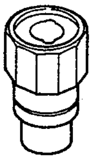
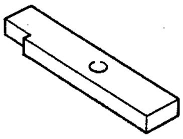
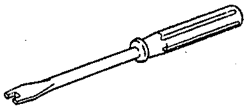

(A) Lasche freigeben.
Lademotor-einheit
(A) Lasche freigeben.

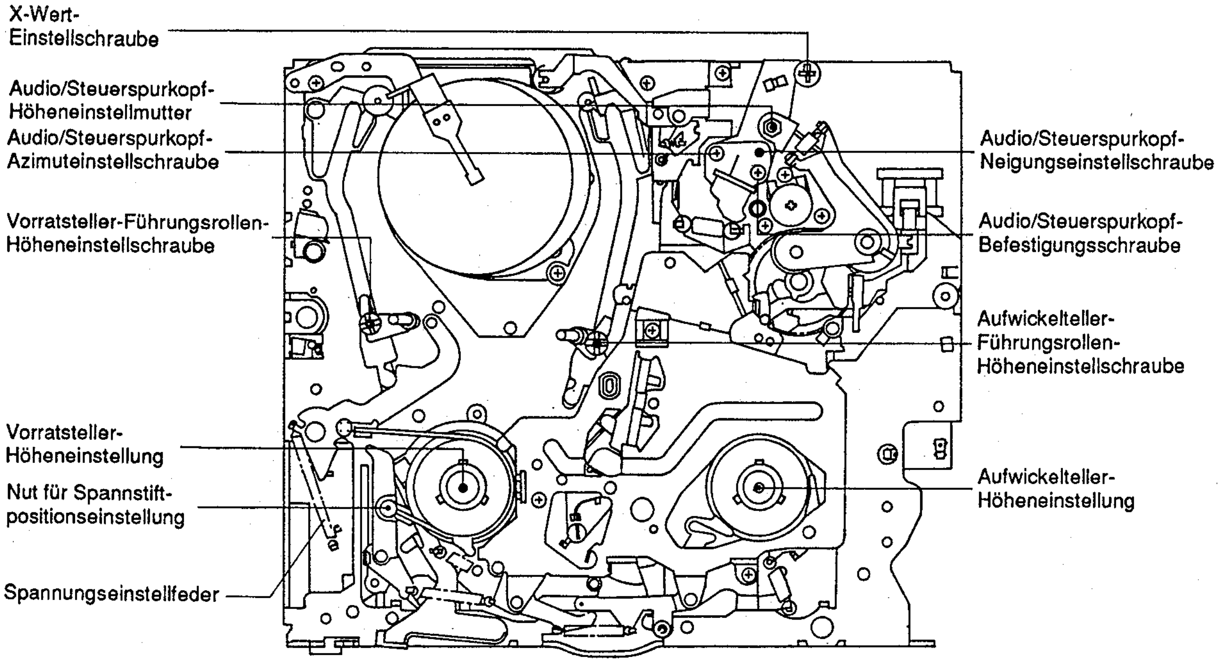
Abb. 4-31

Einstellung des Bandlaufwerks

Vorrichtungen und Bänder für die Einstellung

1. Rückspannungsmesser Teile-Nr. 7099004 	2. NTSC-Abgleichband [für NTSC] Teile-Nr. 7099046 	3. 30HMP2-1 Abgleichband [für NTSC] Teile-Nr. 7099089 
4. PAL-Abgleichband [für PAL] Teile-Nr. 7099052 	5. Hauptmeßlehre Teile-Nr. 7099279 	6. Drehmomentmesser Teile-Nr. 7099039 
7. Adapter für Drehmomentmesser Teile-Nr. 7099035 	8. Wickelteller-Höheneinstellehre Teile-Nr. 7099038 	9. Schraubendreher für Führungsrollen-einstellung Teile-Nr. 7069064 

Anordnung der Einstellteile


X-Wert-Einstellschraube
Audio/Steuerspurkopf-Höheneinstellmutter
Audio/Steuerspurkopf-Azimuteinstellschraube
Vorratsteller-Führungsrollen-Höheneinstellschraube
Vorratsteller-Höheneinstellung
Nut für Spannstift-positionseinstellung
Spannungseinstellfeder
Audio/Steuerspurkopf-Neigungseinstellschraube
Audio/Steuerspurkopf-Befestigungsschraube
Aufwickelteller-Führungsrollen-Höheneinstellschraube
Aufwickelteller-Höheneinstellung

*1: Für den Abgleich des X-Wertes siehe das Kapitel über die elektrischen Abgleiche in der Wartungsanleitung der einzelnen Modelle.

Daraufsicht auf das Bandlaufwerk

Einstellung der mechanischen Teile

1. Bandlaufwerk-Statusschalter

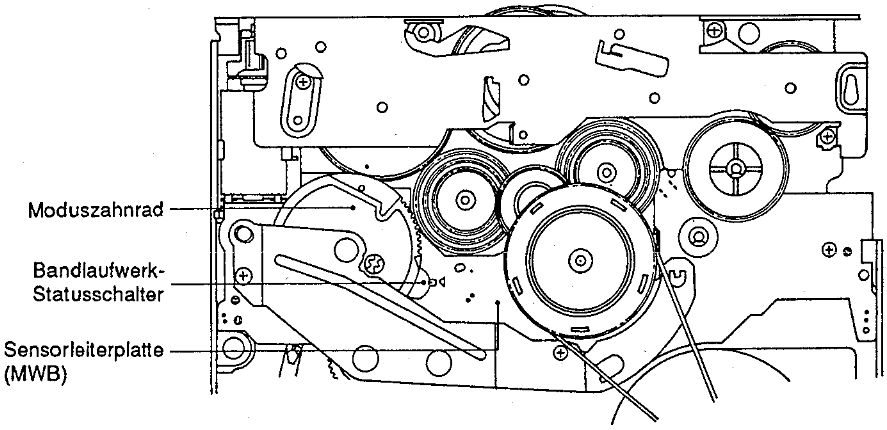
Zweck: Richtige Feststellung des Status des Bandlaufwerks und Vermeidung von Fehlbetrieb.

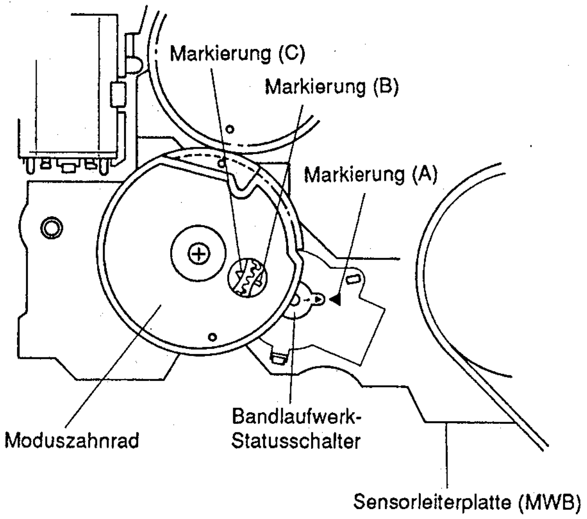
Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
° Leer-Cassette	——	° Auswurfmodus (mit ausgeworfener Cassette)	° Bandlaufwerk-Statusschalter ° Moduszahnrad

Einstellvorgang

1) Darauf achten, daß der Pfeil (A) auf der Sensorleiterplatte (MWB) und der die Nummer 1 anzeigende Pfeil des Bandlaufwerk-Statusschalters ausgerichtet sind.
2) Falls die obige Ausrichtung nicht erhalten wird, wie folgt einstellen.
   1. Die Rollenplatte und das Moduszahnrad entfernen (siehe "Ausbau der Komponenten im AF-Bandlaufwerk" in Kapitel 1).
   2. Den Bandlaufwerk-Statusschalter durch die Bohrung in der Sensorleiterplatte (MWB) drehen, um den Pfeil (A) auf der Sensorleiterplatte (MWB) und den die Nummer 1 anzeigenden Pfeil des Bandlaufwerk-Statusschalters auszurichten.
   3. Das Moduszahnrad wieder einbauen, so daß die Markierung (B) auf dem Bandlaufwerk-Statusschalter und die Markierung (C) auf dem Moduszahnrad ausgerichtet sind.
3) Eine Leer-Cassette einsetzen und die verschiedenen Operationen ausführen, um zu überprüfen, daß das Laden und Entladen richtig ausgeführt werden.

Einstelldiagramm


Moduszahnrad
Bandlaufwerk-Statusschalter
Sensorleiterplatte (MWB)


Markierung (C)
Markierung (B)
Markierung (A)
Moduszahnrad
Bandlaufwerk-Statusschalter
Sensorleiterplatte (MWB)

Einstellung der Teile des Bandtransports

Das Bandtransportsystem ist der Weg von dem Vorratsteller über die Video-Köpfe bis zu dem Aufwickelteller. Die Teile des Bandtransportsystems, und besonders die mit dem Band in Berührung kommenden Teile, müssen sauber und ohne Kratzer, Staub, Öl usw. gehalten werden.

Das Bandtransportsystem wurde werksseitig vor dem Versand eingestellt. Wenn daher Teile ausgetausch werden, wird das Bandtransportsystem stabilisiert, indem nur die neuen Teile richtig eingestellt werden.

1. Einstellung der Wickeltellerhöhe

Zweck: Einstellen der Wickelteller der Cassette auf die vorgeschriebene Höhe, so daß die Höhe des Bandes bestimmt wird.

Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
° Haupteinstellehre (Teile Nr. 7099279)	1. Den Cassetten-Lademechanismus entfernen.	——	° Scheiben in dem Vorrats- und Aufwickelteller
° Wickelteller-Höheneinstellehre (Teile Nr. 7099038)	2. Die Haupteinstellehre einbauen und die Wickelteller-Höheneinstellehre darauf anbringen.		

Einstellvorgang

1) Darauf achten, daß sich der Wickelteller zwischen den Abschnitten A und B der Wickelteller-Höheneinstellehre befindet.
2) Falls sich der Wickelteller nicht zwischen den Abschnitten A und B der Einstellehre befindet, die Scheiben (Dicke 0,5 mm) in dem Wickelteller austauschen oder einstellen.

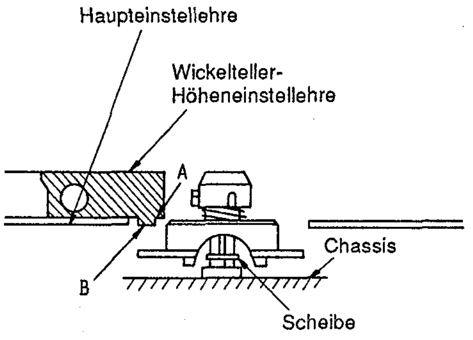
[Austauschmethode]

1) Den Spannarm und das Spannband entfernen.
2) Die obere Platte entfernen.
3) Die Vorratsteller- oder/und die Aufwickelteller-Hauptbremsen entfernen.
4) Die Vorratsteller- oder/und die Aufwickelteller-Hilfsbremsen entfernen.
5) Wickelteller anheben und die Scheiben austauschen oder deren Anzahl einstellen.

[Vorsicht]

Einstellung einer konstanten Bandspannung, so daß der Kontakt zwischen den Video-Köpfen und dem Band stabilisiert ist.

Einstelldiagramm



2. Einstellung der Spannstiftposition und Spannung

Zweck: Einstellung einer konstanten Bandspannung, so daß der Kontakt zwischen den Video-Köpfen und dem Band stabilisiert ist.

Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
Positionseinstellung ——	——	1) Die obere Abdeckung entfernen. 2) Den Videorecorder auf den Ladestatus stellen, ohne eine Cassette einzusetzen (siehe Seite 2-9).	**Positionseinstellung:** Nut für Spannpositionseinstellung
Spannungseinstellung ° Rückspannungsmesser (Teile-Nr. 7099004)		**Spannungseinstellung** 3) Den Rückspannungsmesser wiedergeben.	**Spannungseinstellung** Spannfeder-Einhängposition

Einstellvorgang

— Positionseinstellung —

1) Die Spannfeder an Position (B) einhängen.
2) Einen Schlitzschraubendreher in die Nut für die Spannpositionseinstellung einsetzen und das Spiel zwischen dem Spannarm und dem Chassisende auf 0 bis -1,0 mm einstellen.
3) Nach Beendigung der Einstellung, das Laden ausführen, ohne eine Cassette einzusetzen, und die Spannstiftposition nochmals überprüfen.

— Spannungseinstellung —

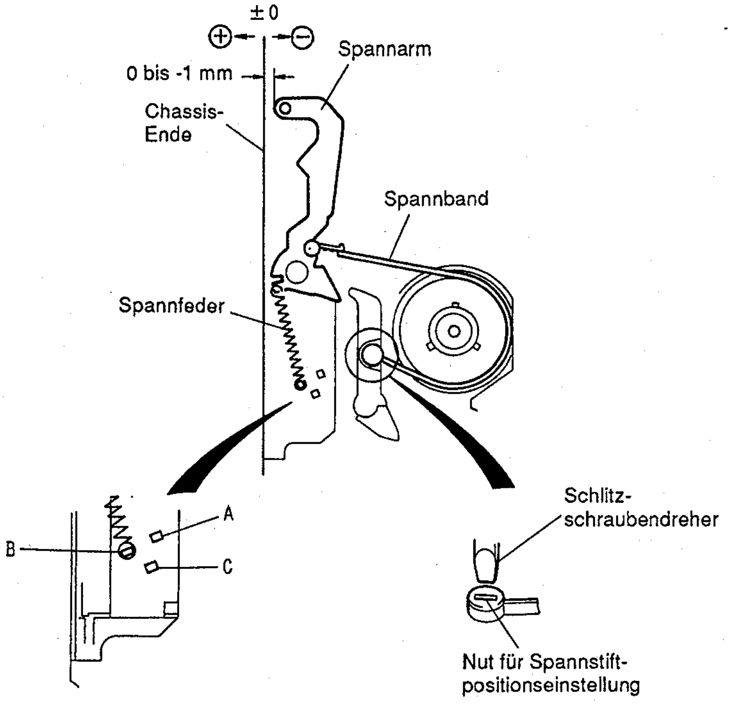
1) Die Spannfeder an Position (B) einhängen.
2) Änderung der Spannarmposition mit dieser Einstellung variiert den Rückspannungs-Drehmomentwert. Die Spannarmposition prüfen, ohne eine Cassette einzusetzen, und dann den Rückspannungsmesser wiedergeben, um zu prüfen, daß das Drehmoment dem folgenden Wert entspricht.

- Wenn der Spannarm -0,5 bis -1 mm von dem Chassis positioniert ist:
  Anzeige des Rückspannungsmessers: 28 bis 36 g.cm (Referenzwert)
- Wenn der Spannarm ±0 bis -0,5 mm von dem Chassis positioniert ist:
  Anzeige des Rückspannungsmessers: 25 bis 32 g.cm (Referenzwert)

3) Falls die Anzeige höher als der Referenzwert ist, die Feder an Position (A) einhängen.
   Falls die Anzeige niedriger als der Referenzwert ist, die Feder an Position (C) einhängen.

Vorsicht: Wenn die Spannposition stark geändert wird (mehr als 6 g.cm), die Spannstiftposition nochmals überprüfen. Falls diese ausgedriftet ist, die Spannstiftposition und die Spannung nochmals einstellen.

Einstelldiagramm



3. Einstellung der Führungsrollenhöhe

Zweck: Regulierung der Höhe des Bandes, so daß die Unterkante des Bandes entlang der Bandführungslinie der Kopftrommel läuft.

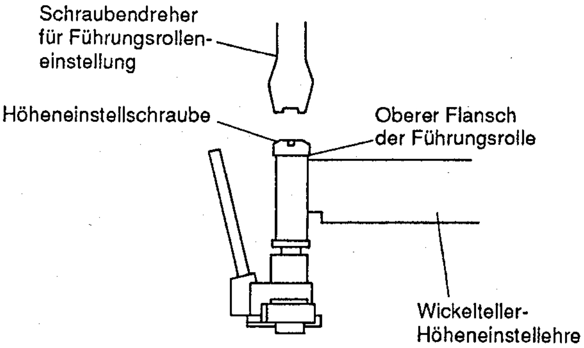
Grobeinstellung

Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
° Haupteinstellehre (Teile-Nr. 7099279)	1) Den Cassettenlademechanismus entfernen.	——	° Höheneinstellschrauben an den Vorrats- und Aufwickelteller-Führungsrollen
° Wickelteller-Höheneinstellehre (Teile-Nr. 7099038)	2) Die Hauptmeßlehre montieren und die Wickelteller-Höheneinstellehre darauf anbringen.		
° Einstellschraubendreher (Teile-Nr. 7069064)			

Einstellvorgang

1) Die Unterkante des oberen Flansches der Führungsrolle und die Wickelteller-Höheneinstellehre ausrichten.
2) Danach die Feineinstellung vornehmen.

Einstelldiagramm


Schraubendreher für Führungsrolleneinstellung
Höheneinstellschraube
Oberer Flansch der Führungsrolle
Wickelteller-Höheneinstellehre

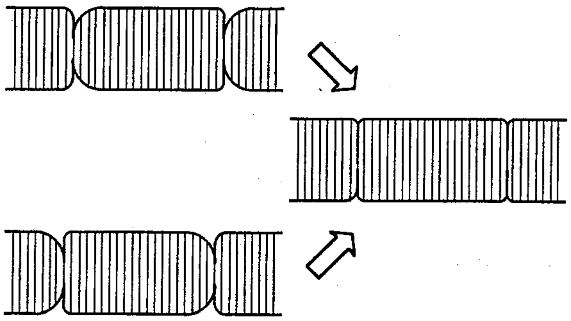
Feineinstellung

Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
° Oszilloskop	° CH-1: PB FM ° CH-2: SW25Hz oder 30Hz	° Abgleichband wiedergeben (Farbbalkenabschnitt)	° Führungsrollen-Höheneinstellschrauben
° Abgleichband	——		

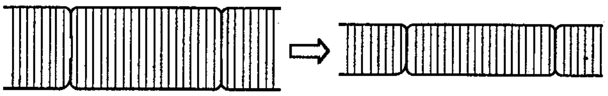
Einstellvorgang

1) Spurlagenregler (Wiedergabe): Automatischer Spurlagenregelungsmodus
(Wenn diese Einstellung nach dem Austausch der Kopftrommel durchgeführt wird, den Spurlagenregler so einstellen, daß der FM-Ausgang ein Maximum annimmt.)
2) Höheneinstellschraube: Die FM-Hüllkurve linear einstellen.
3) Die Spurlagenregler-Erhöhungs- und -Verminderungstasten drücken.
4) Darauf achten, daß die FM-Hüllkurve am Beginn und am Ende gleichmäßig abfällt.

Wellenformen



Die Führungsrollen-Höheneinstellschraube etwas drehen, um die Wellenform linear zu machen.



Automatischer Spurlagenregelungsmodus

Die Spurlagenreglertasten drücken.

4. Einstellung des Audio/Steuerspurkopfes

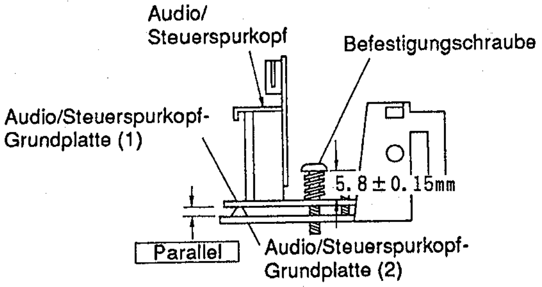
Zweck: Gleichmäßiger Kontakt zwischen dem Band und dem Kopf, so daß die vorgeschriebene Spur bespielt und wiedergegeben wird.

Grobeinstellung

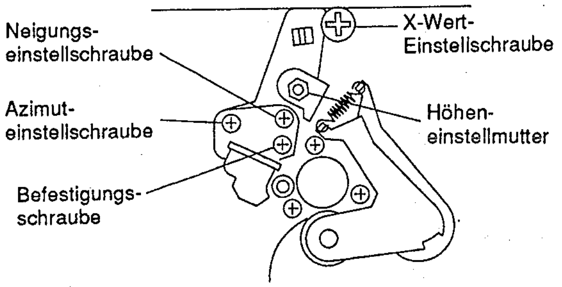
Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
° Leer-Cassette	——	° Leer-Cassette abspielen.	° Audio/Steuerspurkopf-Befestigungsschraube ° Azimuteinstellschraube ° Höheneinstellmutter ° Neigungseinstellschraube

Einstellvorgang/Einstelldiagramm

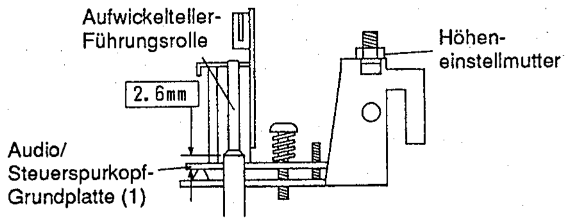
1) Audio/Steuerspurkopf-Befestigungsschraube: Überprüfen, daß der Federabschnitt der Audio/Steuerspurkopf-Befestigungsschraube um 5,8 ± 0,15 mm über die Oberkante der Kopfgrundplatte (1) übersteht.


Audio/
Steuerspurkopf
Befestigungschraube
Audio/Steuerspurkopf-
Grundplatte (1)
5.8 ± 0.15mm
Parallel
Audio/Steuerspurkopf-
Grundplatte (2)

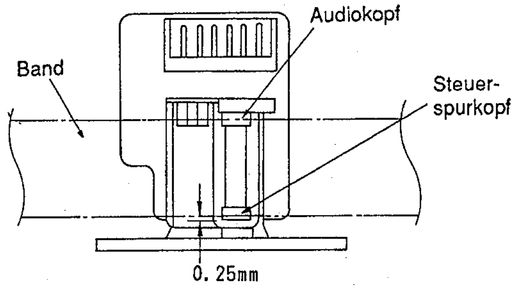
2) Neigungseinstellschraube, Azimuteinstellschraube: Die Kopfgrundplatten (1) und (2) parallel einstellen.


Neigungs-
einstellschraube
X-Wert-
Einstellschraube
Azimut-
einstellschraube
Höhen-
einstellmutter
Befestigungs-
schraube

3) Höheneinstellmutter: Die Höhe der Audio/Steuerspurkopf-Grundplatte (1) so einstellen, daß ihre Oberkante um etwa 2,6 mm niedriger als der untere Flansch des Aufwickelteller-Führungsstiftes angeordnet ist.


Aufwickelteller-
Führungsrolle
Höhen-
einstellmutter
2. 6mm
Audio/
Steuerspurkopf-
Grundplatte (1)

4) Eine Leer-Cassette laden und den Videorecorder auf den Wiedergabemodus schalten.
5) Darauf achten, daß es zu keiner Faltenbildung rund um den Audio/Steuerspurkopf kommt und das Band nicht über dem Flansch läuft. Falls Faltenbildung festgestellt wird oder das Band über dem Flansch läuft, die Neigungseinstellschraube, die Azimuteinstellschraube und die Höheneinstellmutter nochmals einstellen. Wenn die Unterkante des Bandes von der Unterkante des Steuerspurkopfs um 0,25 mm entfernt ist, dann ist die Höhe des Audio/Steuerspurkopfs ideal eingestellt.


Audiokopf
Band
Steuer-
spurkopf
0. 25mm

6) Danach die Feineinstellung ausführen.

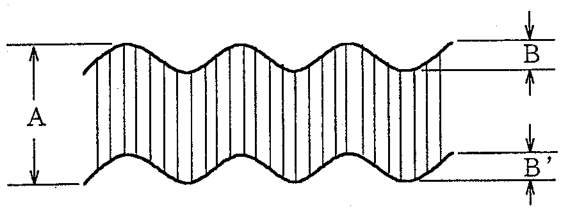
Feineinstellung

Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
° Oszilloskop	° AUDIO OUT Buchse	° Abgleichband wiedergeben (Treppenstufenabschnitt)	° Azimuteinstellschraube ° Höheneinstellmutter ° Neigungseinstellschraube
° Abgleichband	——		

Einstellvorgang

1) Die Azimuteinstellschraube, die Höheneinstellmutter und die Neigungseinstellschraube abwechselnd und in kleinen Schritten einstellen: Den Audio-Ausgang auf ein Maximum und auf linearen Verlauf (minimale Schwankungen) einstellen.

Wellenformen



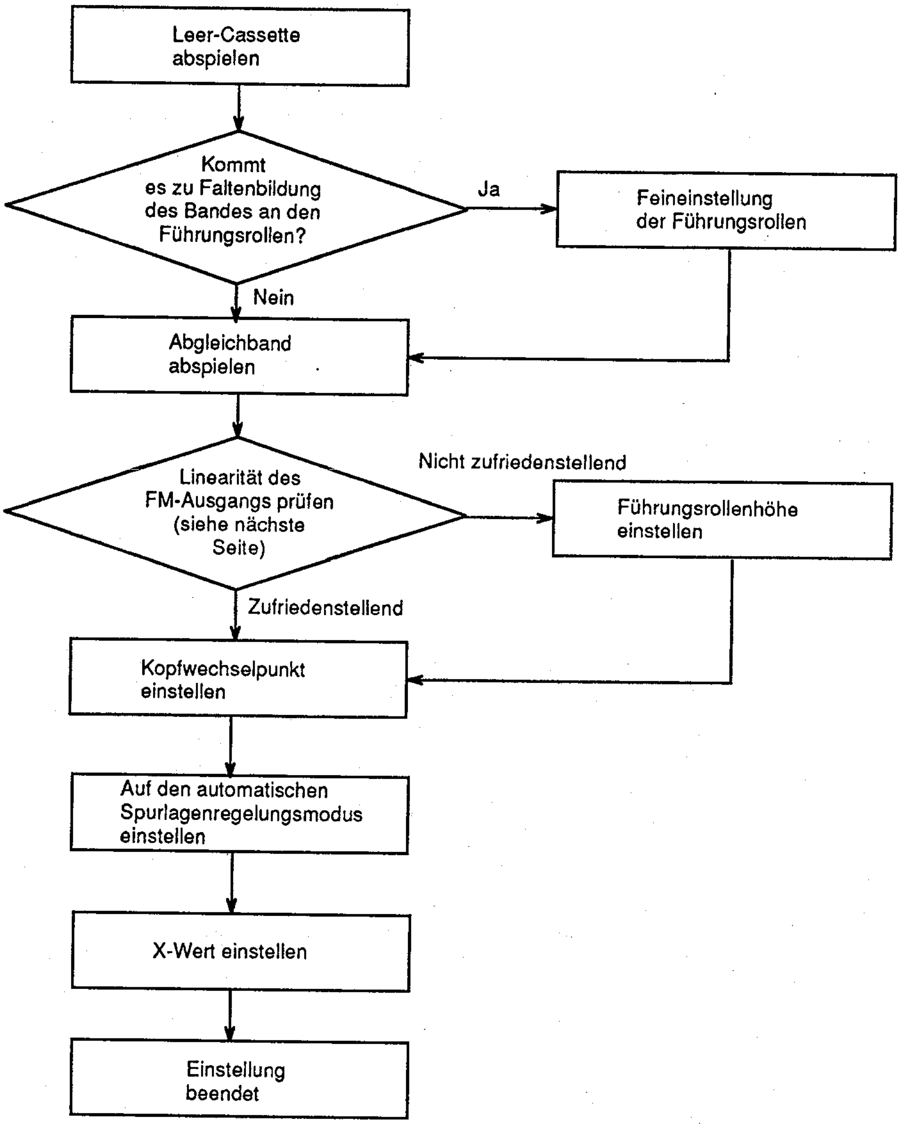
A: Maximum BB': Minimum

5. Einstellungen nach dem Austausch der Kopftrommel (Video-Köpfe)

Zweck: Unterdrückung der Drift in der Höhe relativ zu den Führungsrollen und der Drift des X-Wertes usw. Diese Driftwerte sollten jedoch ein Minimum aufweisen, wenn die Kopftrommel richtig ausgetauscht wurde.

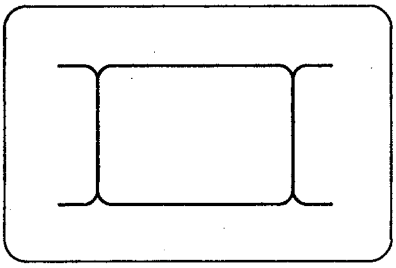
Prüfeinrichtung/ Vorrichtung	Vorbereitung für die Einstellung	Status des Videorecorders	Einstellpunkte
° Oszilloskop	° CH-1: PB FM ° CH-2: SW25Hz oder 30Hz	° Leer-Cassette abspielen	° Führungsrollen (Feineinstellung auf Seite 2-5)
° Abgleichband	——	° Abgleichband wiedergeben (Treppenstufenabschnitt)	[Elektrische Einstellung] ° Kopfwechselpunkt ° X-Wert
° Leer-Cassette	——		

Einstellvorgang

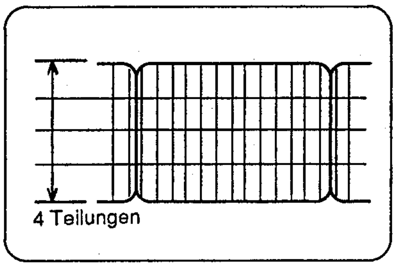

Leer-Cassette abspielen
Kommt es zu Faltenbildung des Bandes an den Führungsrollen?
Ja
Feineinstellung der Führungsrollen
Nein
Abgleichband abspielen
Linearität des FM-Ausgangs prüfen (siehe nächste Seite)
Nicht zufriedenstellend
Führungsrollenhöhe einstellen
Zufriedenstellend
Kopfwechselpunkt einstellen
Auf den automatischen Spurlagenregelungsmodus einstellen
X-Wert einstellen
Einstellung beendet

Prüfvorgang für Linearität und Schwankungen des FM-Ausgangs und Wellenformdiagramme

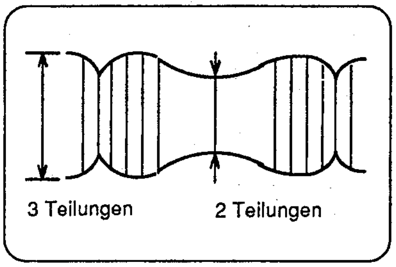
1) Auf den automatischen Spurlagenregelungsmodus einstellen.



2) Feineinstellung des Spannungspegelbereichs des Oszilloskops vornehmen, um den FM-Ausgang auf 4 Teilungen einzustellen.



3) Die Spurlagenregelungstasten drücken, um die maximale Amplitude des FM-Ausgangs auf 3 Teilungen einzustellen.
4) Darauf achten, daß die minimale Amplitude mehr als 2 Teilungen beträgt.



5) Darauf achten, daß die Pegelschwankungen zwischen den maximalen und minimalen Amplituden weniger als 13% betragen.

6. Kontrolle der Spannungs-/Drehmomentwerte

Zweck: Die Spannung, das Drehmoment und die Andrückkraft des Bandaufwickelabschnittes müssen geprüft werden, damit glatter Bandlauf und optimales Leistungsvermögen des Videorecorders sichergestellt werden. Diese Prüfungen ausführen, wenn der Bandlauf nicht glatt oder die Bandgeschwindigkeit abnormal ist.

Prüfeinrichtung/Vorrichtung	Status des Videorecorders
° Drehmomentmesser ° Adapter für Drehmomentmeßlehre	° Den Videorecorder auf die einzelnen Betriebmodi schalten, ohne eine Cassette einzusetzen (siehe 2-9).

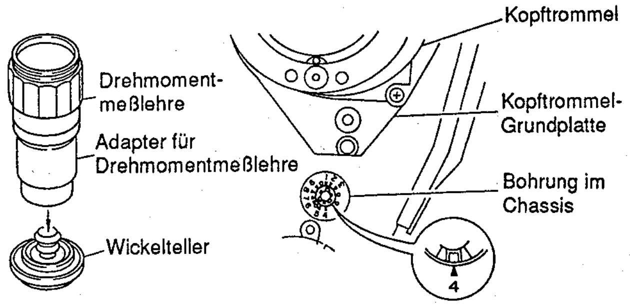
Benennung	Betriebsmodus des Videorecorders	Meßteller	Meßwert
Hauptbremsmoment	Stopp (Hinweis)	Vorrats- und Aufwickelteller	100 - 250 g.cm
Bandspannmoment	Entladen	Vorratsteller	120 - 250 g.cm
Schnellvorlaufmoment	Schnellvorlauf	Aufwickelteller	400 g.cm oder mehr
Rücklaufmoment	Rücklauf	Vorratsteller	400 g.cm oder mehr
Aufwickelmoment	Wiedergabe	Aufwickelteller	40 - 70 g.cm
Rückspannungsmoment	Schnellvor- und Rücklauf	Vorrats- und Aufwickelteller	3 - 13 g.cm
Rückspulmoment	Rückspulen	Vorratsteller	160 - 350 g.cm
Rückwärts-Wiedergabemoment	Rückwärts-Wiedergabe	Vorratsteller	160 - 250 g.cm
Zeitlupenmoment	Zeitlupe	Aufwickelteller	25 - 70 g.cm

Prüfverfahren

Die Drehmomentmeßlehre und den Adapter für die Drehmomentmeßlehre am Wickelteller anbringen und die Drehmomentmeßlehre mit Ihren Fingern festhalten.

Hinweis: Um die Hauptbremsen an den Vorrats- und Aufwickeltellern anzubringen, den Videorecorder in den Ladestatus schalten, ohne eine Cassette einzusetzen, und eine Minute in dem LOADING-STOP-Modus warten. Der Bandlaufwerk-Statusschalter schaltet von der Anzenge "6" auf "4". Darauf achten, daß die Hauptbremsen unter dieser Bedingung an den Wickeltellern angreifen und danach die Messung ausführen.

Einstelldiagramm



Betriebsprüfung des Bandlaufwerks

Den Betrieb des Bandlaufwerks prüfen, nachdem der mechanische Block demontiert und eingestellt wurde. Den Betrieb prüfen, nachdem das Bandlaufwerk in den Ladestatus geschaltet wurde, onhe eine Cassette einzusetzen. Falls das Bandlaufwerk nicht normal arbeitet, die dem Problem entsprechenden Komponenten und Abschnitte nochmals kontrollieren.

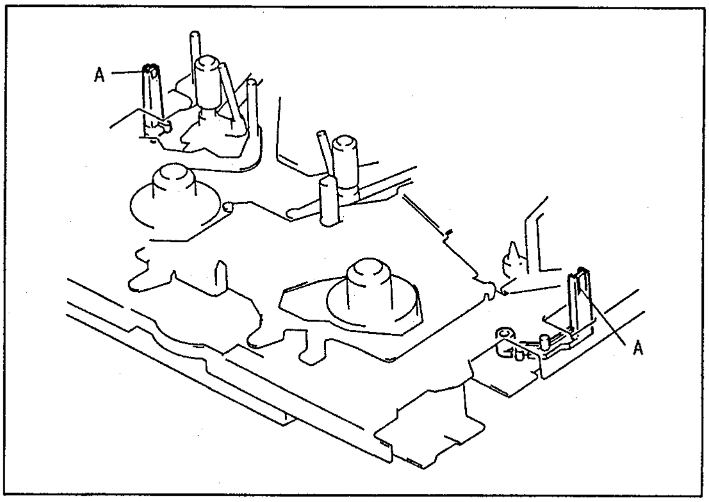
1. Methode für das Schalten des Videorecorders in den Ladestatus, ohne eine Cassette einzusetzen

Das Netzkabel von der Netzdose abziehen.

Die obere Abdeckung und die Frontplatte entfernen.

Den Cassettenlademechanismus entfernen.

Die Bandendensensoren (Abschnitte A in der rechten Abbildung) mit schwarzem Isolierband usw. abdecken, um Lichteinfall zu verhindern.



Das Netzkabel wieder an die Netzdose anschließen und den Videorecorder einschalten.

Die Kopftrommel dreht und die Führungsrollen sind in den Ladestatus geschaltet. Der Videorecorder befindet sich in dem LOADING-STOP-Modus in Bereitschaft (der Modusschalter ist auf "6" gestellt). ✻-1

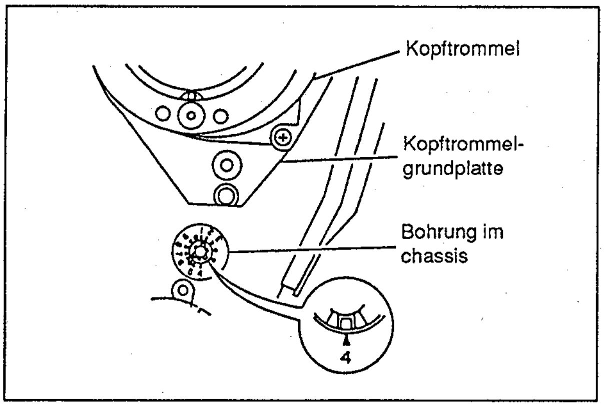
✻-1: In diesem Status kann der Videorecorder die Eingänge in den einzelnen Modi annehmen. Rückspulen ist jedoch nur für einige Sekunden möglich, da sich der Aufwickelteller in dem Stoppstatus befindet und die Wickeltellerimpulse nicht festgestellt werden können. Für den Rücklaufvorgang ist der Aufwickelteller manuell zu drehen.

Mit der auf der nächsten Seite beschriebenen Betriebsprüfung fortfahren.

Wenn der Stoppmodus für eine Minute andauert, werden die Andruckrolle und Spannarm nicht mehr angedrückt (der Modusschalter ist auf "4" gestellt). Nach weiteren fünf Minuten wird die Kopftrommel gestoppt.

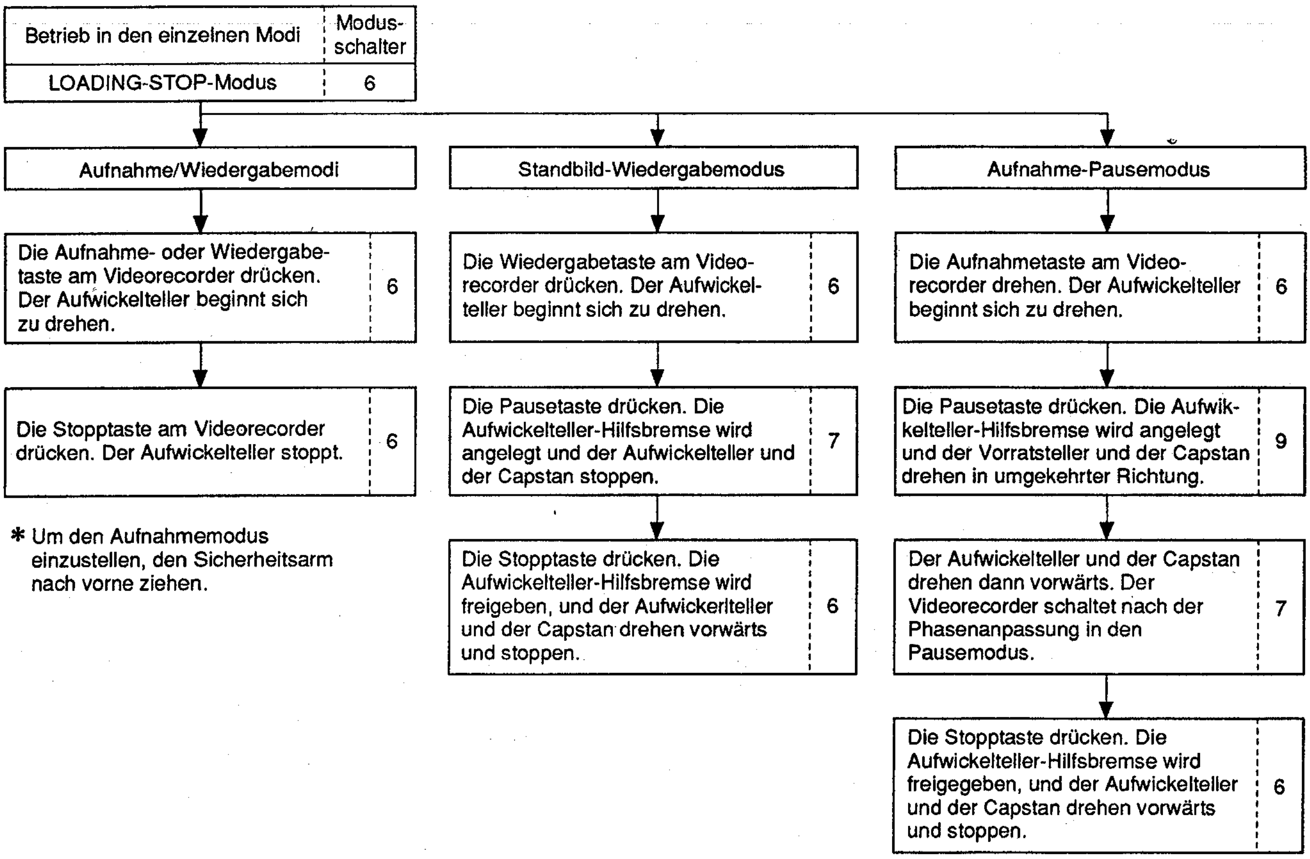
[Methode zur Prüfung der Position des Modusschalters]

Den Bandlaufwerkstatus durch die Bohrung im Chassis vor der Kopftrommel betrachten. Die Modusposition kontrollieren, indem die mit der Nut in der Schalterwelle ausgerichtete Pfeilnummer des Bandlaufwerk-Statusschalters abgelesen wird.



Bei einem Modell, das keine Leiterplatte an der Unterseite des Bandlaufwerks aufweist, die eingestellte Nummer des Bandlaufwerk-Statusschalters direkt von der Unterseite kontrollieren.

2. Prüfen des Betriebs in den einzelnen Modi



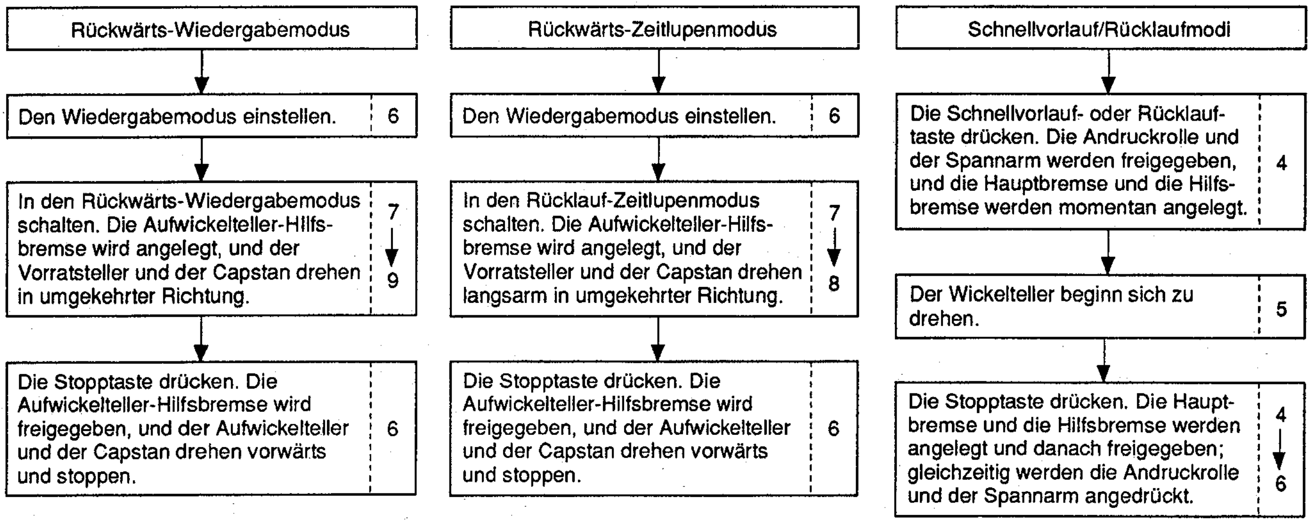
Betrieb in den einzelnen Modi	Modusschalter
LOADING-STOP-Modus	6

Aufnahme/Wiedergabemodi	Modusschalter
Die Aufnahme- oder Wiedergabetaste am Videorecorder drücken. Der Aufwickelteller beginnt sich zu drehen.	6
Die Stopptaste am Videorecorder drücken. Der Aufwickelteller stoppt.	6

* Um den Aufnahmemodus einzustellen, den Sicherheitsarm nach vorne ziehen.

Standbild-Wiedergabemodus	Modusschalter
Die Wiedergabetaste am Videorecorder drücken. Der Aufwickelteller beginnt sich zu drehen.	6
Die Pausetaste drücken. Die Aufwickelteller-Hilfsbremse wird angelegt und der Aufwickelteller und der Capstan stoppen.	7
Die Stopptaste drücken. Die Aufwickelteller-Hilfsbremse wird freigeben, und der Aufwickerlteller und der Capstan drehen vorwärts und stoppen.	6

Aufnahme-Pausemodus	Modusschalter
Die Aufnahmetaste am Videorecorder drehen. Der Aufwickelteller beginnt sich zu drehen.	6
Die Pausetaste drücken. Die Aufwickelteller-Hilfsbremse wird angelegt und der Vorratsteller und der Capstan drehen in umgekehrter Richtung.	9
Der Aufwickelteller und der Capstan drehen dann vorwärts. Der Videorecorder schaltet nach der Phasenanpassung in den Pausemodus.	7
Die Stopptaste drücken. Die Aufwickelteller-Hilfsbremse wird freigegeben, und der Aufwickelteller und der Capstan drehen vorwärts und stoppen.	6



Rückwärts-Wiedergabemodus	Modusschalter
Den Wiedergabemodus einstellen.	6
In den Rückwärts-Wiedergabemodus schalten. Die Aufwickelteller-Hilfsbremse wird angelegt, und der Vorratsteller und der Capstan drehen in umgekehrter Richtung.	7 → 9
Die Stopptaste drücken. Die Aufwickelteller-Hilfsbremse wird freigegeben, und der Aufwickelteller und der Capstan drehen vorwärts und stoppen.	6

Rückwärts-Zeitlupenmodus	Modusschalter
Den Wiedergabemodus einstellen.	6
In den Rücklauf-Zeitlupenmodus schalten. Die Aufwickelteller-Hilfsbremse wird angelegt, und der Vorratsteller und der Capstan drehen langsarm in umgekehrter Richtung.	7 → 8
Die Stopptaste drücken. Die Aufwickelteller-Hilfsbremse wird freigegeben, und der Aufwickelteller und der Capstan drehen vorwärts und stoppen.	6

Schnellvorlauf/Rücklaufmodi	Modusschalter
Die Schnellvorlauf- oder Rücklauftaste drücken. Die Andruckrolle und der Spannarm werden freigegeben, und die Hauptbremse und die Hilfsbremse werden momentan angelegt.	4
Der Wickelteller beginn sich zu drehen.	5
Die Stopptaste drücken. Die Hauptbremse und die Hilfsbremse werden angelegt und danach freigegeben; gleichzeitig werden die Andruckrolle und der Spannarm angedrückt.	4 → 6

Nach Beendigung der Prüfung, unbedingt den Videorecorder wie folgt wiederum in den ursprünglichen Status schalten.

1) Den Videorecorder ausschalten.
2) Das Isolierband usw. von den Vorratsteller- und Aufwickelteller-Bandendensensoren entfernen.
3) Das Netzkabel von der Netzdose abziehen.
4) Den Cassettenlademechanismus einbauen, um die Arbeit zu beenden.

Entfernen der im Bandlaufwerk belassenen Cassette

Falls die Cassette aufgrund einer Störung im Bandlaufwerk nicht ausgeworfen werden kann, die Cassette wie folgt entfernen.

[Arbeitsvorgang]

1. Die oberen und unteren Abdeckungen entfernen.
2. Drei Befestigungsschrauben des Bandlaufwerks entfernen und die Vorderseite des Bandlaufwerks anheben.

Das Band ist an der Kopftrommel verwickelt.

Das Band ist in der Mitte herausgezogen und weist einen Durchhang auf.

Den Lademotor gegen den Uhrzeigersinn (in die gezeigte Pfeilrichtung) drehen, um die Führungsrollen in den Entladestatus zu schalten.

Gleichzeitig das Capstan-Schwungrad gegen den Uhrzeigersinn drehen, um das Band in die Cassette zurückzuspulen (dabei darauf achten, daß das Band nicht beschädigt wird).

Den Lademotor erneut gegen den Uhrzeigersinn drehen, um ihn in den Entladestatus zu bringen (den Motor bis zum Anschlag drehen).

Das Band wird nicht aus der Cassette herausgezogen.

Den Lademotor in Pfeilrichtung drehen, um ihn in den Ladestatus zu stellen (den Motor bis zum Anschlag drehen).

Das Capstan-Schwungrad gegen den Uhrzeigersinn drehen, um die Cassette aus dem Cassettenlademechanismus auszuwerfen.

Beendet

Die Cassette wird nicht aus dem Cassettenlademechanismus ausgeworfen, wenn die Mittelriemenscheibe gedreht wird.

Die Drehungen der FL-Relaiszahnräder [A], [B] und [C] prüfen (darauf achten, daß keine Fremdkörper und Beschädigungen vorhanden sind).

Die Drehungen der FL-Relaiszahnräder und der FL-Zahnräder [B] und [A] des Cassettenlademechanismus prüfen (darauf achten, daß keine Fremdkörper und Beschädigungen vorhanden sind).

Beendet

Falls das FL-Zahnrad [A] nicht dreht, den Cassettenlademechanismus entfernen; danach die Zahnradhalterung vom Mechanismus abnehmen und das FL-Zahnrad [A] drehen, um die Cassette auszuwerfen.

Beendet

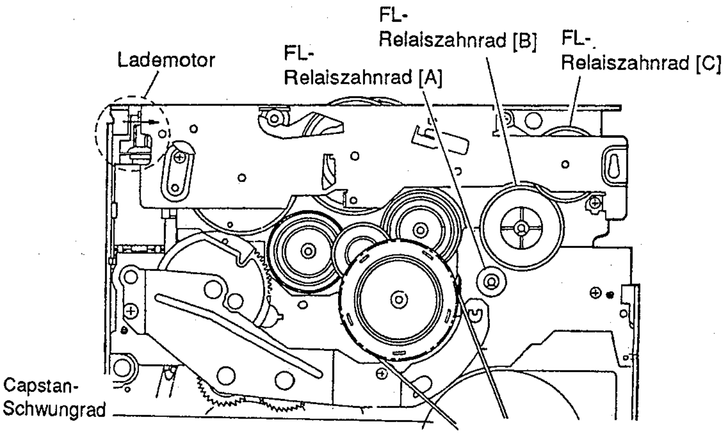


Abb. 1

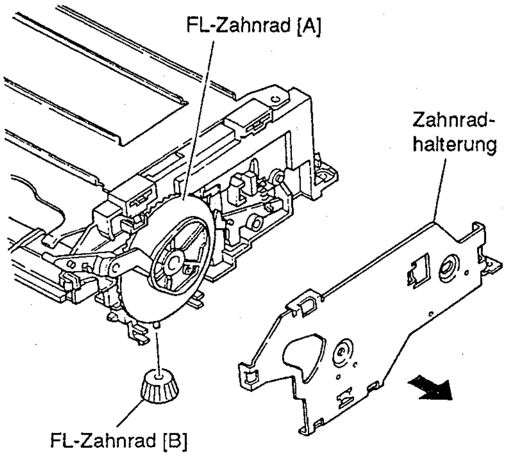


Abb. 2

Wartung und Inspektion

1. Notwendigkeit von Wartung und Inspektion

Die Aufnahmedichte eines Videorecorders ist viel höher als die eines Tonbandgerätes. Ein Videorecorder verwendet äußerst genaue Komponenten, um Kompatibilität mit anderen Videorecordern sicherzustellen. Falls eine der mechanischen Komponenten abgenutzt oder verschmutzt ist, werden die gleichen Symptome wie bei Fehlbetrieb des Videorecorders erhalten.

Um ein gutes Bild sicherzustellen, muß das Bandlaufwerk regelmäßig gereinigt und geschmiert werden, wobei abgenutzte Komponenten erneuert werden müssen.

2. Geplante Wartung und Inspektion

Die Zeitabstände für Wartung und Inspektion sind nicht fest, da sie in Abhängigkeit von der Verwendung des Videorecorders und den Umweltbedingungen, unter welchen der Videorecorder verwendet wird, stark variieren. Allgemein kann aber gesagt werden, daß ein gutes Bild sichergestellt wird, wenn Wartung und Inspektion alle 1.000 Betriebsstunden ausgeführt werden. Tabelle 1 zeigt den Zusammenhang zwischen Betriebszeit und Inspektionsperiode.

Tabelle 1

Durchschnittliche Betriebsstunden pro Tag	Wenn Inspektion erforderlich ist		
	Etwa 1 Jahr	Etwa 18 Monate	Etwa 3 Jahre
Eine Stunde	▨	▨	▨
Zwei Stunden	▨	▨	
Drei Stunden	▨		

3. Bevor Versagen des Videorecorders festgestellt wird

Wenn ein Videorecorder über 1.000 Stunden verwendet wurde, können die in Tabelle 2 aufgeführten Symptome im Wiedergabebild auftreten. Diese Fehler können durch Reinigen und Schmieren der mechanischen Komponenten behoben werden. Die Betriebsstundenzahl des Videorecorders gemäß Tabelle 1 kontrollieren. Falls Sie feststellen, daß Inspektion und Wartung des Videorecorders erforderlich sind, die in Tabelle 2 aufgeführten Punkte prüfen.

Vorsicht: Falls der Videorecorder durch Reinigung der in der Teileaustauschspalte mit "○" markierten Komponenten nicht auf normalen Betrieb zurückgebracht werden kann, dann sind diese Teile abgenutzt. Diese Teile müssen daher erneuert werden.

Tabelle 2

Symptom	Ursache	Inspektionspunkt	Teileaustausch
Farbschlieren	Gesamtlöschkopf (FE) verschmutzt oder abgenutzt	Die mit dem Band in Berührung kommende Fläche des Gesamtlöschkopfes (FE) reinigen.	
Schlechter Rauschabstand, keine Farbe	Videoköpfe verschmutzt oder abgenutzt	Videoköpfe reinigen.	○
Vertikaler Jitter	Videoköpfe oder Kopftrommel verschmutzt. Bandtransportsystem verschmutzt.	Videoköpfe und Kopftrommel reinigen. Führungsrollen und Neigungsführungen reinigen.	
Niedriege Lautstärke oder verzerrter Klang	Audio/Steuerspurkopf (A/C) verschmutzt	Die mit dem Band in Berührung kommende Fläche des Audio/Steuerspurkopfes reinigen.	○
Band weist Durchhang auf oder wird nicht transportiert	Andruckrolle verschmutzt	Andruckrolle und Capstanwelle reinigen.	○

Inspektionspunkte

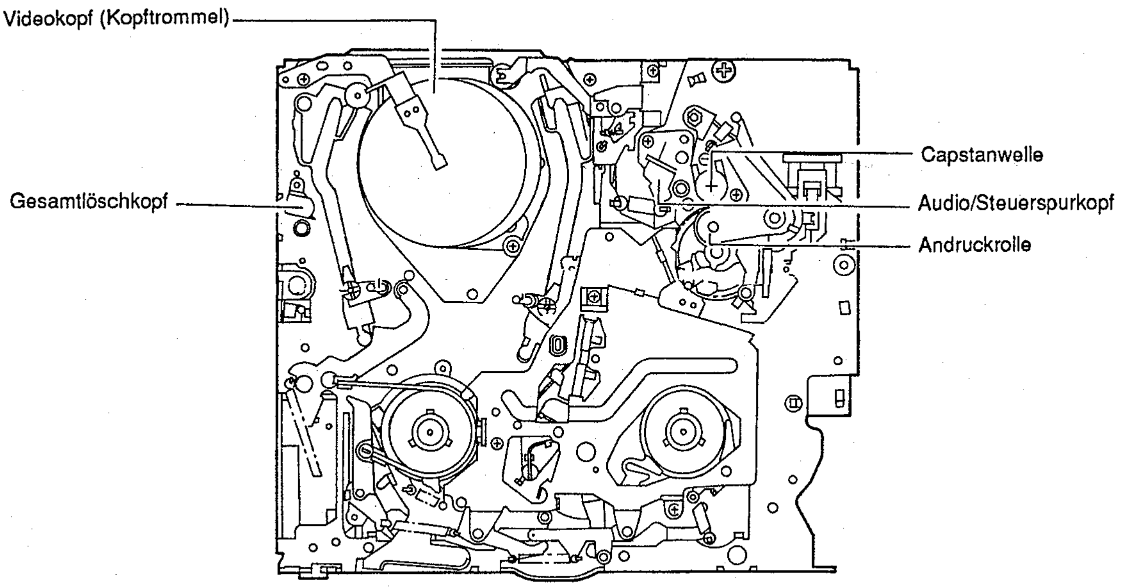


Abb. 1 Inspektionspunktdiagramm

4. Für Inspektion und Wartung erforderliche Werkzeuge

(1) Kopfreinigungssatz (Abb. 2)
(2) Fett und Öl für Videorecorder (Tabelle 3)
(3) Alkohol
(4) Watte

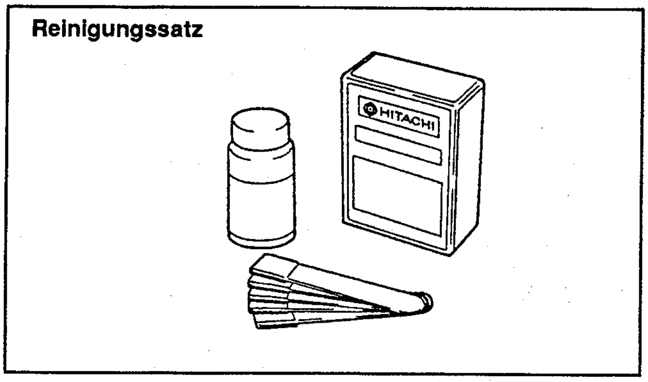


Abb. 2

Tabelle 3 Verwendung von Öl und Fett

Name	Schmier - oder Fettpunkte
Sonic Slidas Öl (Nr. 1600)	Langsam drehende Abschnitte schmieren
Molicoat (PG-641)	Metall- und Kunststoffabschnitte unter leichter Belastung schmieren

5. Reinigungsvorgang

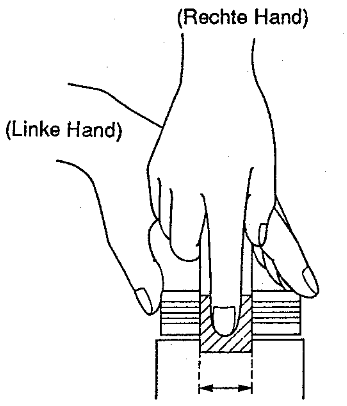
(1) Reinigen der Videoköpfe

Zuerst eine Reinigungscassette verwenden. Falls der an den Köpfen anhaftende Schmutz durch die Reinigungscassette nicht entfernt werden kann, den Kopfreinigungssatz verwenden, um die Köpfe wie folgt zu reinigen.

- Das Reinigungsstäbchen mit Reinigungsflüssigkeit anfeuchten, das Reinigungsstäbchen an die Kopfspitze anlegen und den Kopf (Kopftrommel) vorsichtig nach links und rechts drehen. (Das Reinigungsstäbchen nicht vertikal bewegen und darauf achten, daß nur das Reinigungsleder am Reinigungsstäbchen die Kopfstpitzen berührt. Anderenfalls können die Köpfe beschädigt werden.)

Nach dem Reinigen müssen die Köpfe gründlich getrocknet werden, bevor ein Band abgespielt wird. Falls Reinigungsflüssigkeit auf den Köpfen verbleibt, kann das Band beschädigt werden, wenn dieses in Berührung mit den Köpfen kommt.

[Reinigungsmethode]



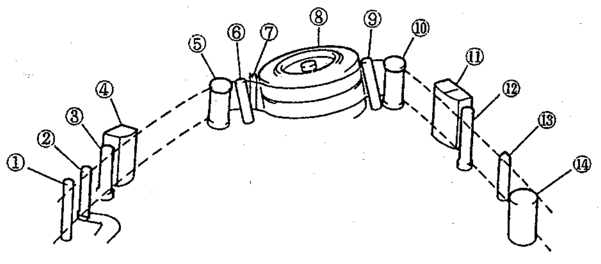
Bereich, Im dem die obere Kopftrommel bewegt wird.

Abb. 3

(2) Reinigen des Bandtransportsystems

Einen Wattebausch mit Alkohol anfeuchten und die Komponenten ① - ⑭ reinigen (siehe "Reinigen der Videoköpfe" für Komponenten ⑧).

Vorsicht: Beim Reinigen ist äußerste Vorsicht geboten, damit die Bandtransportkomponenten nicht beschädigt oder durch übermäßige Kraft verformt werden.



① Vorratstellerstift
② Spannstift
③ Vorratsteller-Führungsstift
④ Gesamtlöschkopf (FE)
⑤ Führungsrolle
⑥ Neigungsstift
⑦ Impedanzrolle
⑧ Kopftrommel
⑨ Neigungsstift
⑩ Führungsrolle
⑪ Audio/Steuerspurkopf (A/C)
⑫ Aufwickelteller-Führungsstift
⑬ Capstanwelle
⑭ Andruckrolle

Abb. 4

6. Schmieren und Fetten

(1) Richtlinien für das Schmieren

Den Öler verwenden, um ein oder zwei Tropfen von Sonic Slidas Öl aufzutragen. Darauf achten, daß nicht zu viel Öl verwendet wird, da dieses austreten und in Kontakt mit drehenden Teilen kommen kann, wodurch Schlupf und andere Probleme verursacht verwenden können. Falls zu viel Öl aufgetragen wurde, dieses mit eine mit Alkohol angefeuchteten Wattebausch abwischen.

(2) Richtlinien für das Fetten

Fett (Molicoat) mit einem Stäbchen oder einem Pinsel auftragen. Niemals zu viel Fett verwenden. Es könnte in Kontakt mit dem Bandtransport oder dem Antriebssystem kommen. Überschüssiges Fett mit einem mit Alkohol angefeuchteten Wattebausch abwischen und reinigen.

Öl oder Fett an den vorgeschriebenen Punkten auftragen, die in Tabelle 4 auf der nächsten Seite aufgeführt sind.

7. Zu wartende/prüfende Teile und Wartungs/Prüfungsplan

Tabelle 4

Vorsicht: Die folgende Tabelle betrifft nicht alle Einheiten. Der Wartungs/Prüfungsplan hängt von der Verwendung der Einheit und den Umgebungsbedingungen ab.

Stunden Komponente und Punkte	1000	2000	3000	4000	5000
Videoköpfe (Kopftrommel)	R / A	R / A	R / A	R / A	R / A
Audio/Steuerspurkopf	R	R / A	R	A	R
Gesamtlöschkopf	R	R	R	A	R
Vorratsteller-Führungsrolle	R	R	R / A	R	R
Aufwickelteller-Führungsrolle	R	R	R / A	R	R
Spannband		A		A	
Spannarm	R	R	R	R	R
Vorratsteller		R		R	
Aufwickelteller		R		R	
Andruckrolleneinheit	R	A	R	A	R
Antriebsriemen		R		R	
Capstanmotor	R	A	R	A	R
Lademotor				A	
Kopftrommelmotor		A		A	
Bandlaufwerk-Statusschalter				(A)	
Wickelteller-Zahnrad L		A		A	
Wickelteller-Zahnrad R		A		A	
Wickelteller-Antriebszwischenzahnrad		A		A	
Neigungsführung der Vorratsteller-Führungsrollen-Grundplatte	R	R	R	R	R
Neigungsführung der Aufwickelteller-Führungsrollen-Grundplatte	R	R	R	R	R
Impedanzrolle	R	R	R	R	R
Bandführungen (Führungsstifte)	R	R	R	R	R
Bandführungslinie der untere Kopftrommel	R	R	R	R	R
Vorratsteller/Aufwickelteller-Hauptbremsen	R	R / A	R	R / A	R
Vorratsteller/Aufwickelteller-Hilfsbremsen	R	R / A	R	R / A	R
Kopfreinigungshalterung					(A)
Welle des Vorratstellers		S		S	
Welle des Aufwickeltellers		S		S	
Welle des Wickelteller-Zahnrades R		S		S	
Welle des Wickelteller-Zahnrades R		S		S	
Weller des Mittelriemenscheibe		S		S	
Welle der Andruckrolleneinheit		M		M	
Führungsrollen-Grundplatten-Gleitteil des Chassis					M
Kontaktteil der Kopftrommel-Grundplatte und der Spitze der Führungsrollen-Grundplatte					M
Kontaktteil des Spannarms und der Vorratsteller-Führungsrollen-Grundplatte					M
Gleitteil des Chassis, der oberen Platte und des Andruckrollen-Antriebsarms					M

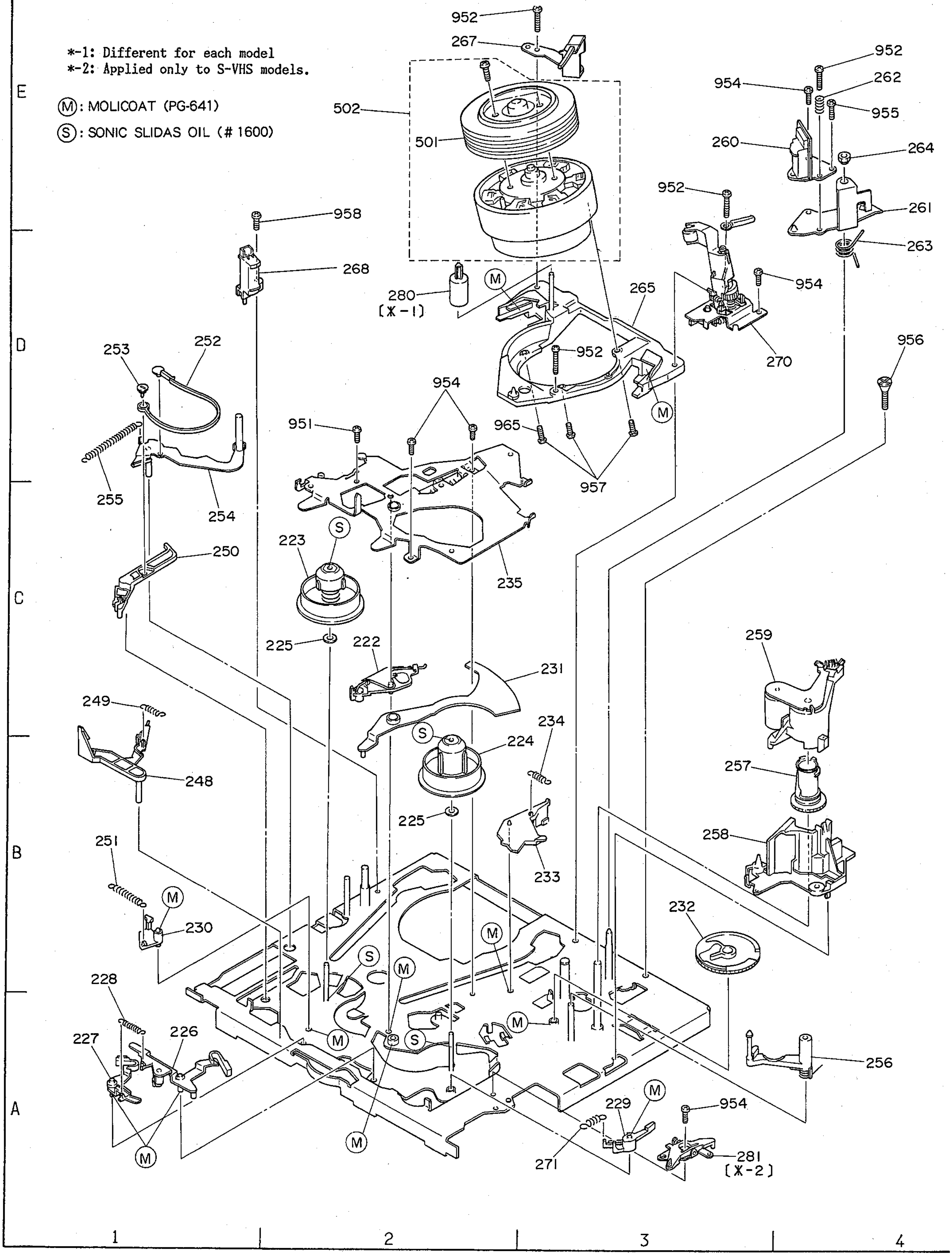
A: Austauschen des Teils
R: Reinigen
S: Nachfüllen von Öl (Sonic Slidas Oil)
M: Nachfüllen von Fett (Molicoat)

EXPLODED VIEWS

CHASSIS (1) SECTION

*-1: Different for each model
*-2: Applied only to S-VHS models.

Ⓜ: MOLICOAT (PG-641)
Ⓢ: SONIC SLIDAS OIL (# 1600)


952
267
952
954
262
955
502
501
260
264
952
261
958
263
268
954
280
[*-1]
265
270
956
253
252
952
954
951
965
957
255
254
223
250
235
225
222
259
231
249
234
224
257
248
225
258
251
233
232
230
228
226
227
256
229
954
271
281
[*-2]
Ⓜ
Ⓢ
E
D
C
B
A
1
2
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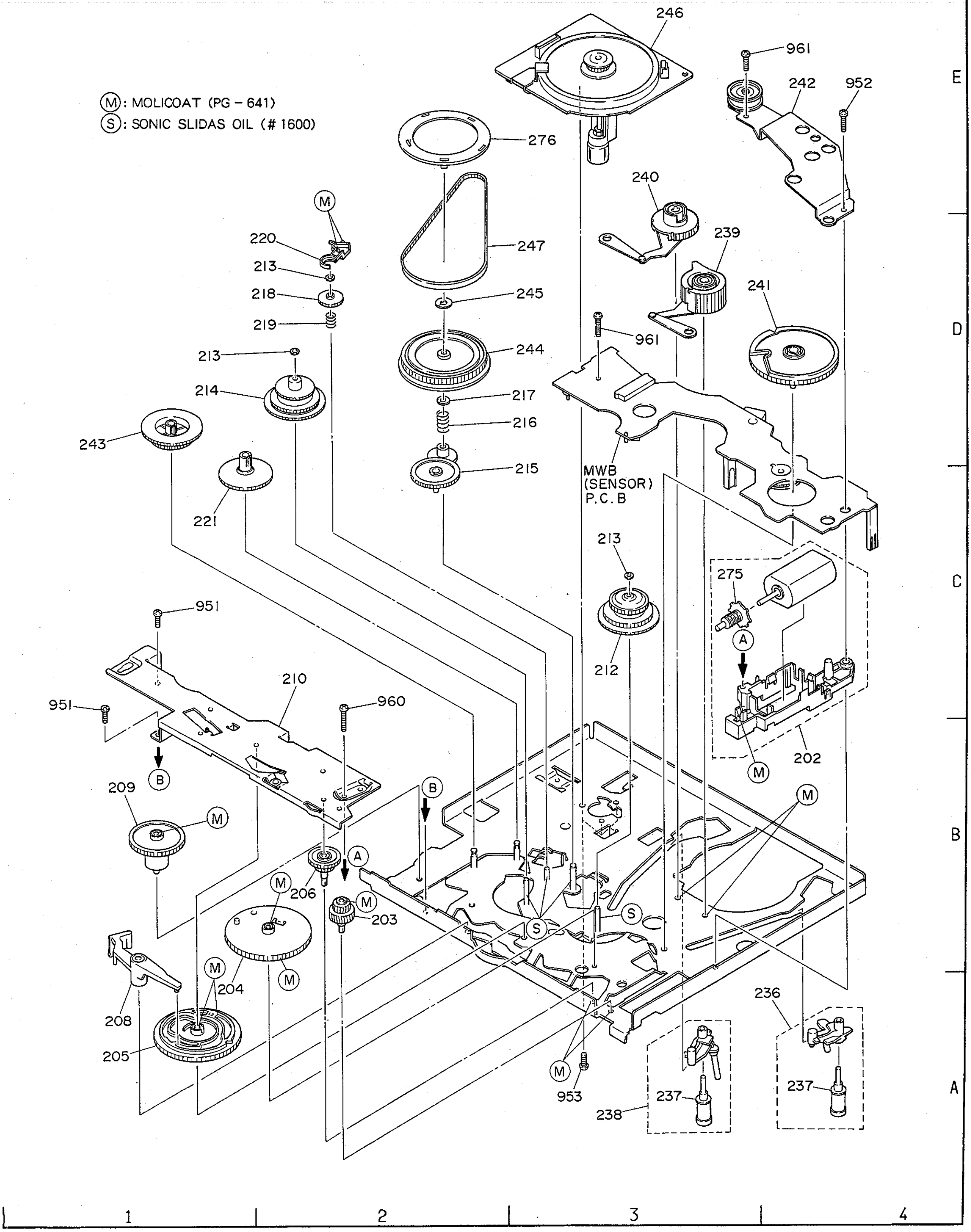
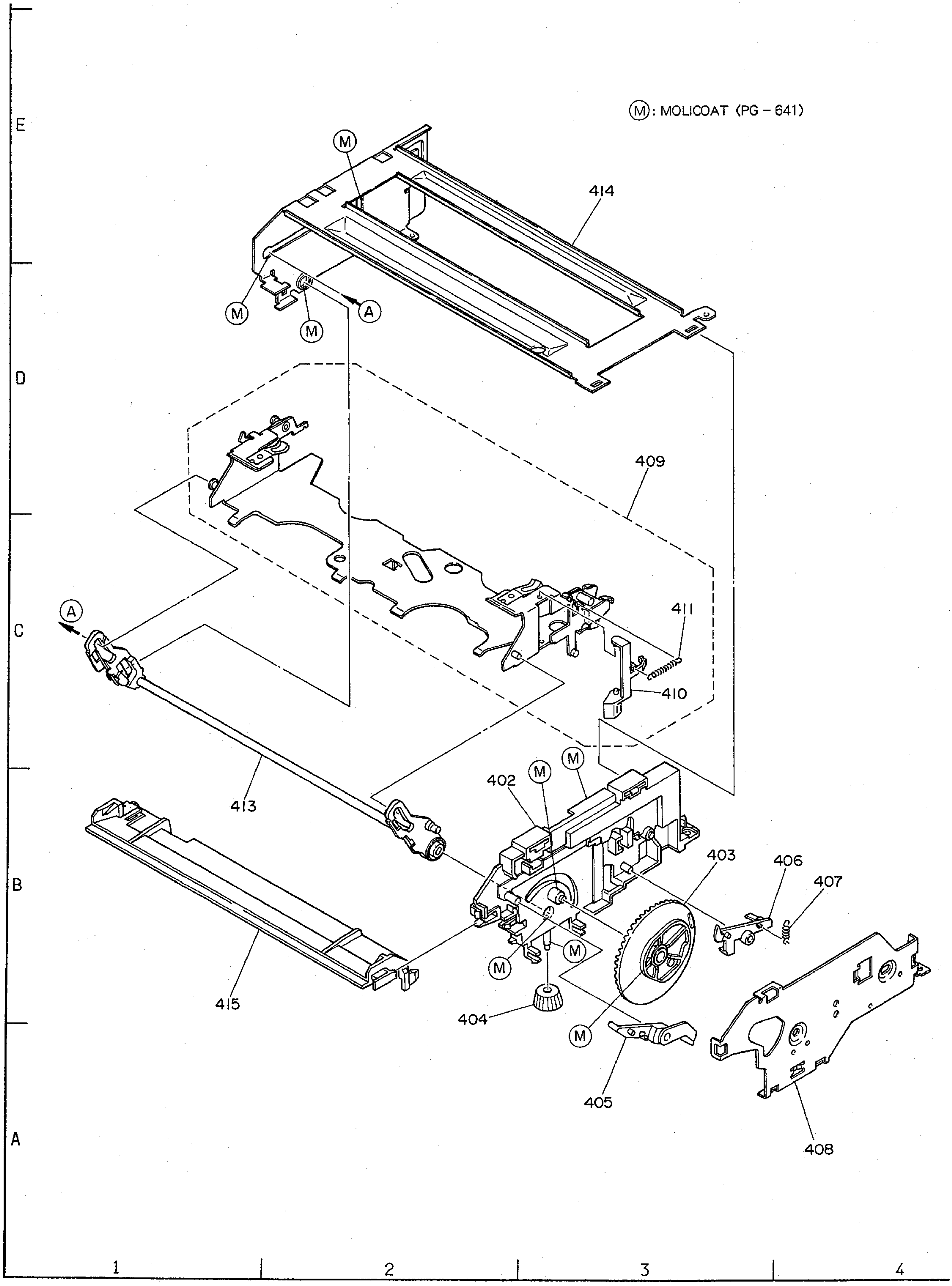
4

CHASSIS (II) SECTION

Ⓜ: MOLICOAT (PG - 641)
Ⓢ: SONIC SLIDAS OIL (# 1600)


246
961
242
952
E
276
240
239
247
220
213
218
219
245
241
961
D
213
244
214
217
216
243
215
MWB
(SENSOR)
P.C.B
221
213
275
C
951
212
210
951
960
202
209
B
206
203
204
208
236
205
953
237
237
238
A
Ⓜ
Ⓢ
Ⓐ
Ⓑ
1
2
3
4

CASSETTE LOADING MECHANISM SECTION


Ⓜ: MOLICOAT (PG – 641)
E
D
C
B
A
1
2
3
4
Ⓜ
414
Ⓜ
Ⓜ
Ⓐ
409
411
410
Ⓐ
413
402
Ⓜ
Ⓜ
403
406
407
415
Ⓜ
Ⓜ
404
Ⓜ
405
408

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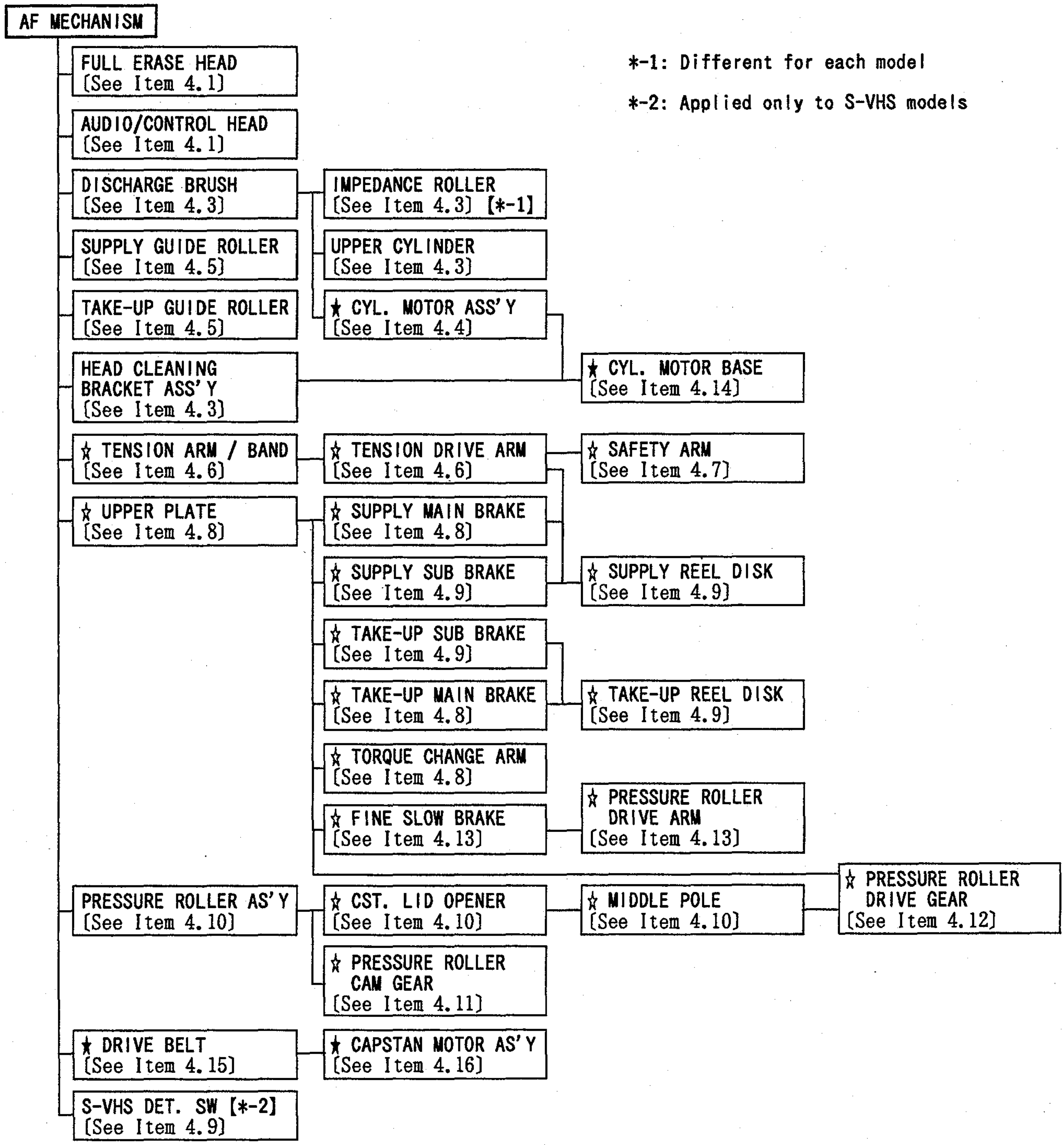
DISASSEMBLY METHOD

Refer to the following "parts hierarchy chart" first when replacing defective parts. This chart shows the parts removal procedure as the hierarchy in which parts should be replaced.

[How to use the parts hierarchy chart]

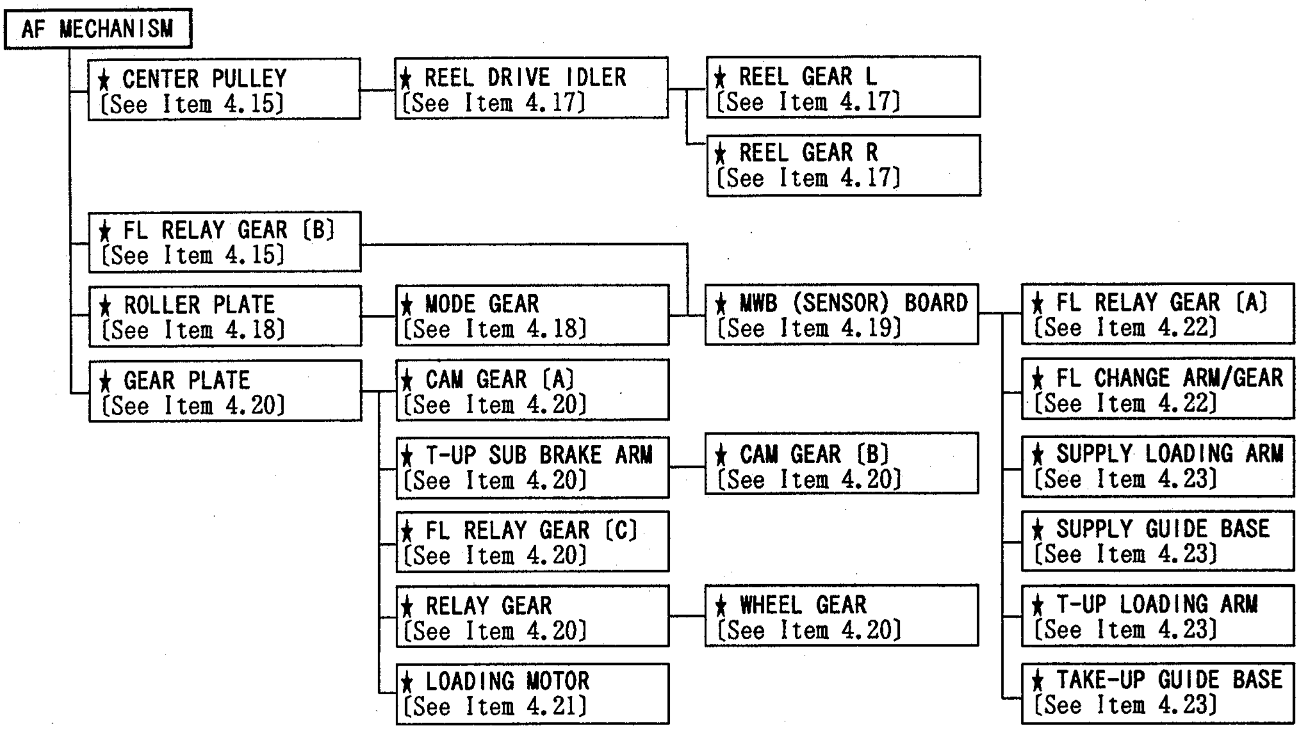
(1) Search for the part to be replaced in the chart.
(2) Check the part in the rank above the part to be replaced and then start dismantling.
(3) Replace the defective part and install it by the reverse procedure to that in the hierarchy chart.

[Parts Hierarchy Chart]

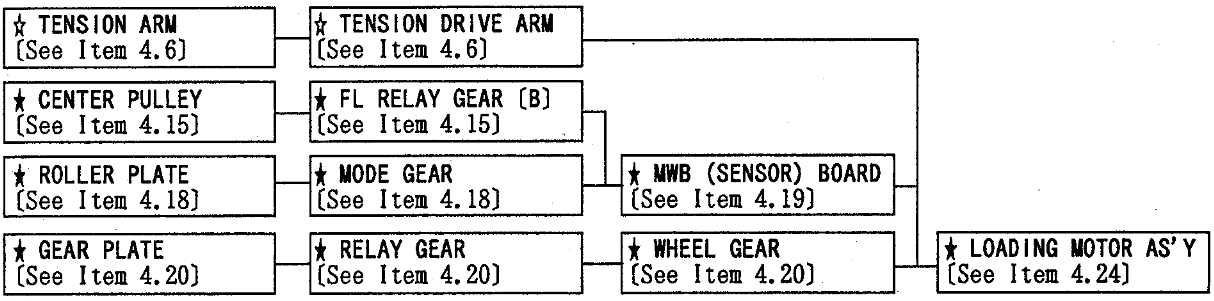

AF MECHANISM
FULL ERASE HEAD [See Item 4.1]
AUDIO/CONTROL HEAD [See Item 4.1]
DISCHARGE BRUSH [See Item 4.3]
SUPPLY GUIDE ROLLER [See Item 4.5]
TAKE-UP GUIDE ROLLER [See Item 4.5]
HEAD CLEANING BRACKET ASS'Y [See Item 4.3]
☆ TENSION ARM / BAND [See Item 4.6]
☆ UPPER PLATE [See Item 4.8]
PRESSURE ROLLER AS'Y [See Item 4.10]
★ DRIVE BELT [See Item 4.15]
S-VHS DET. SW [*-2] [See Item 4.9]
IMPEDANCE ROLLER [See Item 4.3] [*-1]
UPPER CYLINDER [See Item 4.3]
★ CYL. MOTOR ASS'Y [See Item 4.4]
★ CYL. MOTOR BASE [See Item 4.14]
☆ TENSION DRIVE ARM [See Item 4.6]
☆ SAFETY ARM [See Item 4.7]
☆ SUPPLY MAIN BRAKE [See Item 4.8]
☆ SUPPLY SUB BRAKE [See Item 4.9]
☆ SUPPLY REEL DISK [See Item 4.9]
☆ TAKE-UP SUB BRAKE [See Item 4.9]
☆ TAKE-UP MAIN BRAKE [See Item 4.8]
☆ TAKE-UP REEL DISK [See Item 4.9]
☆ TORQUE CHANGE ARM [See Item 4.8]
☆ FINE SLOW BRAKE [See Item 4.13]
☆ PRESSURE ROLLER DRIVE ARM [See Item 4.13]
☆ PRESSURE ROLLER DRIVE GEAR [See Item 4.12]
☆ CST. LID OPENER [See Item 4.10]
☆ MIDDLE POLE [See Item 4.10]
☆ PRESSURE ROLLER CAM GEAR [See Item 4.11]
★ CAPSTAN MOTOR AS'Y [See Item 4.16]

*-1: Different for each model

*-2: Applied only to S-VHS models


AF MECHANISM
★ CENTER PULLEY [See Item 4.15]
★ REEL DRIVE IDLER [See Item 4.17]
★ REEL GEAR L [See Item 4.17]
★ REEL GEAR R [See Item 4.17]
★ FL RELAY GEAR [B] [See Item 4.15]
★ ROLLER PLATE [See Item 4.18]
★ MODE GEAR [See Item 4.18]
★ MWB (SENSOR) BOARD [See Item 4.19]
★ FL RELAY GEAR [A] [See Item 4.22]
★ GEAR PLATE [See Item 4.20]
★ CAM GEAR [A] [See Item 4.20]
★ FL CHANGE ARM/GEAR [See Item 4.22]
★ T-UP SUB BRAKE ARM [See Item 4.20]
★ CAM GEAR [B] [See Item 4.20]
★ SUPPLY LOADING ARM [See Item 4.23]
★ FL RELAY GEAR [C] [See Item 4.20]
★ SUPPLY GUIDE BASE [See Item 4.23]
★ RELAY GEAR [See Item 4.20]
★ WHEEL GEAR [See Item 4.20]
★ T-UP LOADING ARM [See Item 4.23]
★ LOADING MOTOR [See Item 4.21]
★ TAKE-UP GUIDE BASE [See Item 4.23]

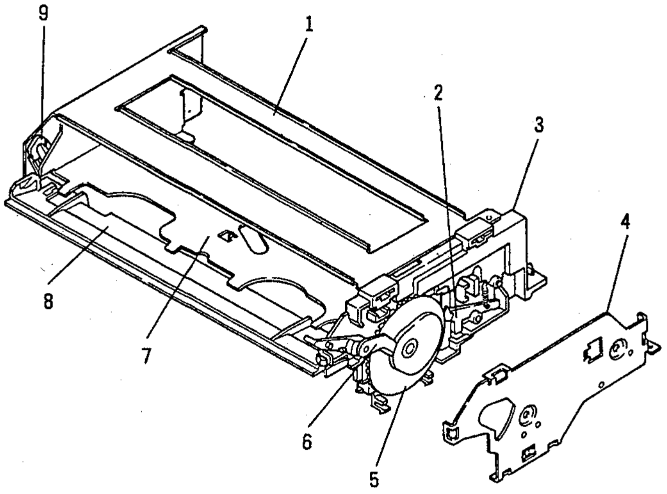
◆ **When dismantling loading motor assembly:**


☆ TENSION ARM [See Item 4.6]
☆ TENSION DRIVE ARM [See Item 4.6]
★ CENTER PULLEY [See Item 4.15]
★ FL RELAY GEAR [B] [See Item 4.15]
★ ROLLER PLATE [See Item 4.18]
★ MODE GEAR [See Item 4.18]
★ MWB (SENSOR) BOARD [See Item 4.19]
★ GEAR PLATE [See Item 4.20]
★ RELAY GEAR [See Item 4.20]
★ WHEEL GEAR [See Item 4.20]
★ LOADING MOTOR AS'Y [See Item 4.24]

◆ **Subsidiary explanation**

Service parts marked ☆ with the cassette loading mechanism removed.
Service parts marked ★ with the AF mechanism removed from the VCR or with the circuit board at the bottom of the AF mechanism open. (*-1)
Parts without any markings can be replaced only when the top cover has been removed.
In the following text, remove the parts in the order of letters (A, B, C ..) shown in the illustrations.

1. IDENTIFICATIONS AND LOCATIONS OF COMPONENTS IN THE CASSETTE LOADING MECHANISM



1. Chassis Holder
2. Switch Arm
3. Side Chassis
4. Gear Bracket
5. FL Gear
6. Door Arm
7. Cassette Holder
8. Front Holder
9. FL Drive Arm

Fig. 1-1 Cassette Loading Mechanism

2. CASSETTE LOADING MECHANISM REMOVAL

1. Cassette Loading Mechanism

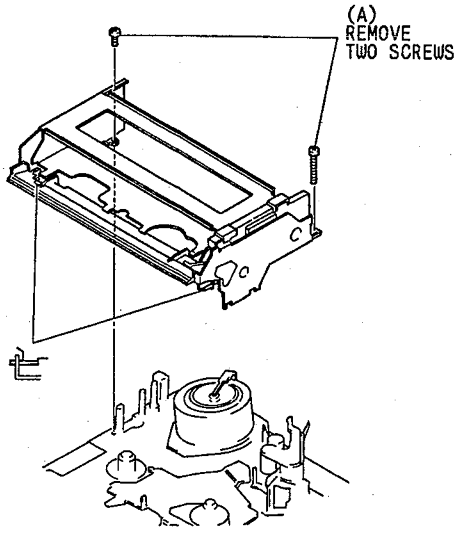

(A)
REMOVE
TWO SCREWS

Fig. 2-1

2. Side Gear Bracket, Chassis Holder, FL Drive Arm, Cassette Holder Assembly and Front Holder

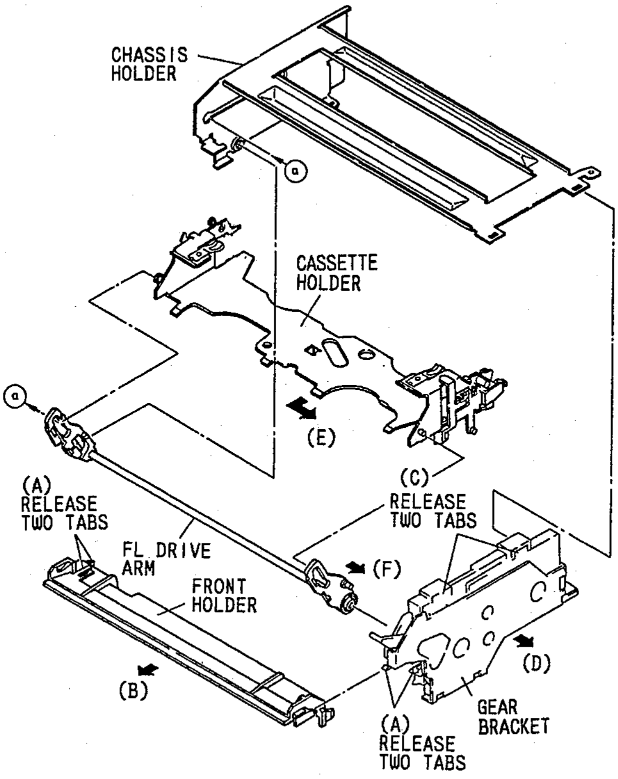

CHASSIS
HOLDER
a
CASSETTE
HOLDER
a
(E)
(C)
RELEASE
TWO TABS
(A)
RELEASE
TWO TABS
FL DRIVE
ARM
FRONT
HOLDER
(F)
(B)
(D)
GEAR
BRACKET
(A)
RELEASE
TWO TABS

Fig. 2-2

◆ **Cautions when reinstalling**

1) Check the insertions of 6 bosses.
2) Check that hole (a) in the side bracket and the hole in the FL gear 〔A〕 are aligned.

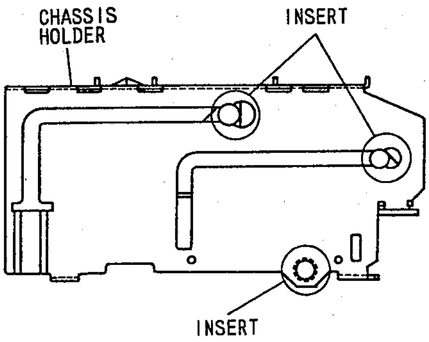

CHASSIS HOLDER
INSERT
INSERT

Fig. 2-3

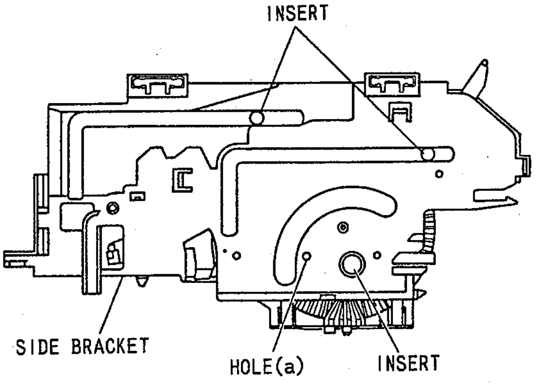

INSERT
SIDE BRACKET
HOLE(a)
INSERT

Fig. 2-4

3. Gear Bracket, Door Arm, FL Gears 〔A〕 / 〔B〕 and Switch Arm

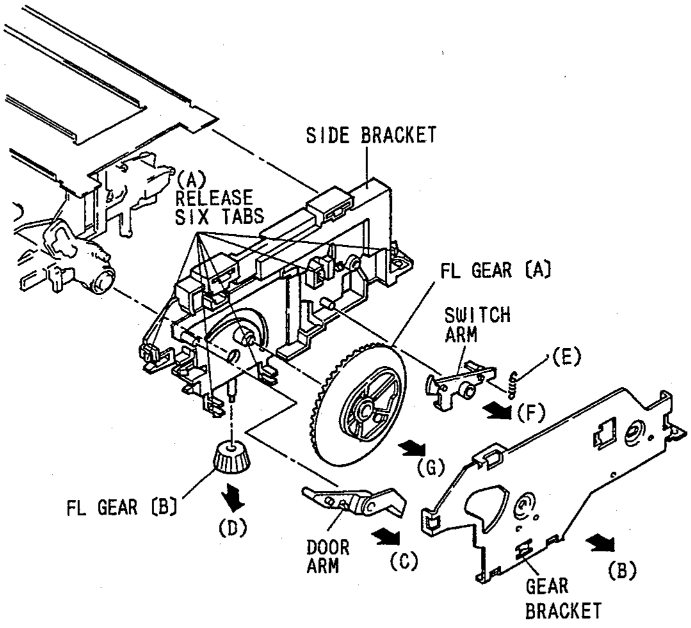

SIDE BRACKET
(A)
RELEASE
SIX TABS
FL GEAR 〔A〕
SWITCH
ARM
(E)
(F)
(G)
FL GEAR 〔B〕
(D)
DOOR
ARM
(C)
GEAR
BRACKET
(B)

Fig. 2-5

◆ **Cautions when reinstalling**

1) When reinstalling FL gear 〔A〕, align the hole in FL gear 〔A〕 and the hole in the side bracket.

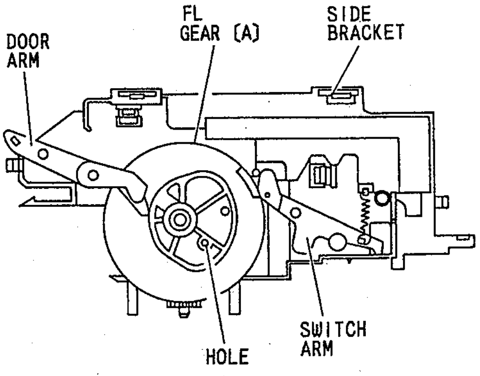
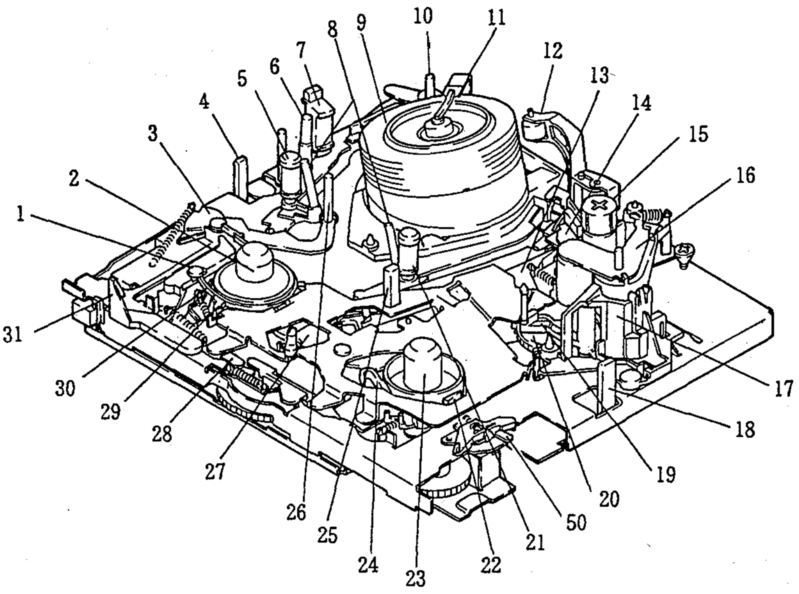

DOOR
ARM
FL
GEAR 〔A〕
SIDE
BRACKET
SWITCH
ARM
HOLE

Fig. 2-6

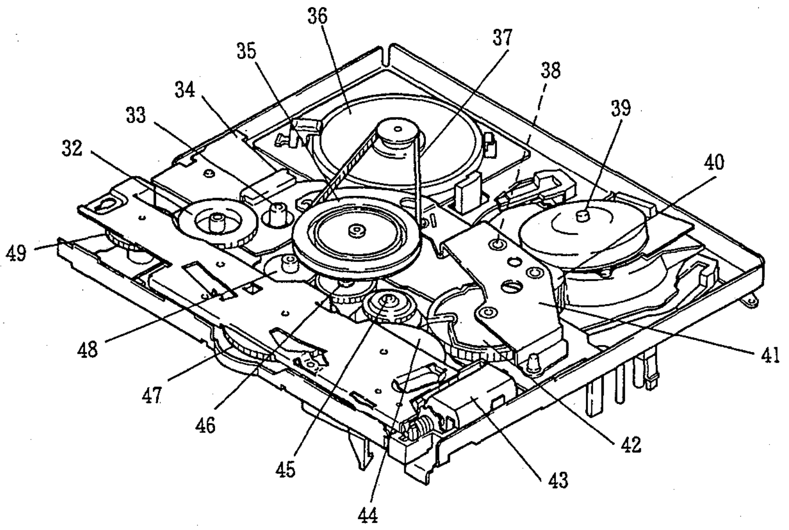
3. IDENTIFICATIONS AND LOCATIONS OF COMPONENTS IN THE AF MECHANISM



*-1: Different for each model
*-2: Applied only to S-VHS models

Fig. 3-1 Top View of Mechanism

1. Tension Drive Arm
2. Supply Reel Disk
3. Tension Arm
4. Supply End Sensor
5. Supply Guide Roller
6. Supply Guide Pole
7. Full Erase (FE) Head
8. Inclined Guides
9. Cylinder Motor Assembly
10. Impedance Roller [*-1]
11. Static Discharge Brush
12. Head Cleaning Arm Assembly
13. Fine Slow Brake Arm
14. Audio/Control (A/C) Head
15. Capstan Shaft Holder
16. Pressure Roller Assembly
17. Cassette Lid Opener
18. Take-up End Sensor
19. Middle Pole
20. Pressure Roller Drive Gear
21. Take-up Guide Roller
22. Take-up Sub Brake
23. Take-up Reel Disk
24. Take-up Main Brake
25. End LED
26. Tension Pole
27. Torque Change Arm
28. Supply Main Brake
29. Supply Sub Brake
30. Tension Band Assembly
31. Safety Arm
50. S-VHS Det. Switch [*-2]



32. FL Relay Gear [B]
33. FL Relay Gear [A]
34. Sensor (MWB) Circuit Board
35. Center Pulley
36. Capstan Motor Assembly
37. Drive Belt
38. Take-up Loading Gear
39. Cylinder Motor Assembly
40. Supply Loading Gear
41. Roller Plate
42. Mode Gear
43. Loading Motor
44. Cam Gear [A]
45. Reel Gear L
46. Reel Drive Idler
47. Cam Gear [B]
48. Reel Gear R
49. FL Relay Gear [C]

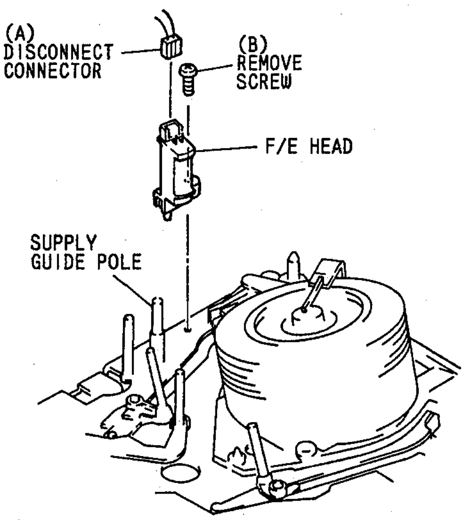
Fig. 3-2 Bottom View of Mechanism

4. COMPONENTS REMOVAL

1. FE (Full Erase) Head

◆ **Caution when reinstalling**

1) Keep the surface of the FE head and supply guide pole which is in contact with the tape clean.



(A) DISCONNECT CONNECTOR
(B) REMOVE SCREW
F/E HEAD
SUPPLY GUIDE POLE

Fig. 4-1

2. A/C (Audio/Control) Head

◆ **Cautions when reinstalling**

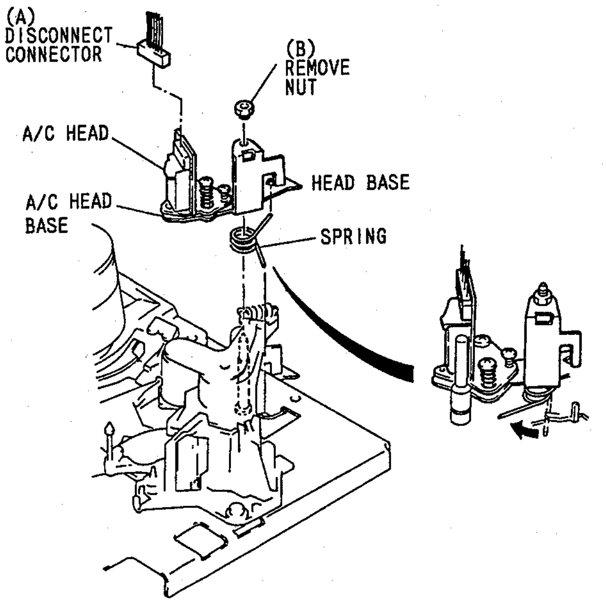
1) Hook the bottom of the spring under the head base to the chassis and the top to the stopper of the head base.
2) Keep the surface of the A/C head which is in contact with the tape clean.

◆ **Mechanical Adjustment after reinstalling**

1) A/C (Audio/Control) Head Adjustment

◆ **Electrical Adjustments after reinstalling**

1) X-Value Adjustment
2) Audio Bias Level Adjustment



(A) DISCONNECT CONNECTOR
(B) REMOVE NUT
A/C HEAD
A/C HEAD BASE
HEAD BASE
SPRING

Fig. 4-2

3. Upper Cylinder, Impedance Roller and Head Cleaning Bracket Assembly

◆ **Cautions during work**

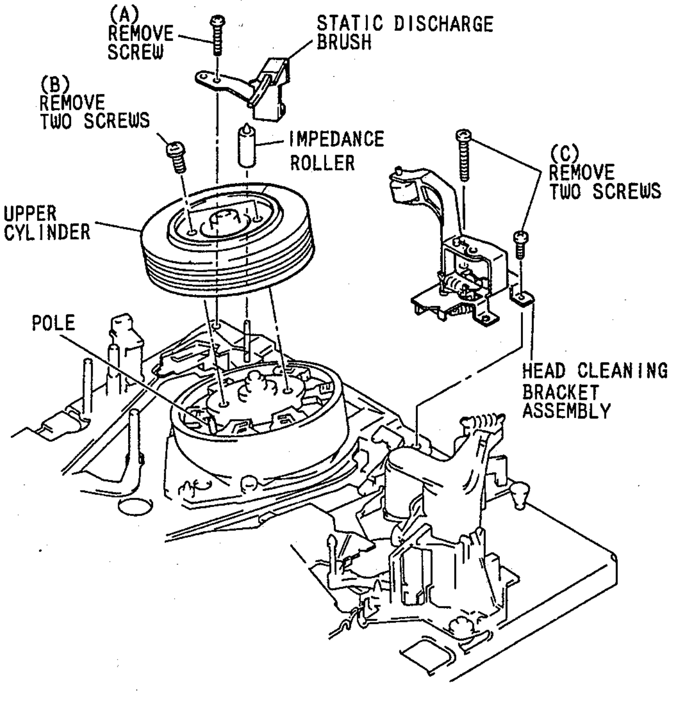
1) Pull out the upper cylinder vertically to the cylinder attachment direction.
2) Do not touch video head tips.

◆ **Cautions when reinstalling**

1) Put the hole in the upper cylinder onto the pole of the lower cylinder.
2) Tighten the two upper cylinder retaining screws alternately.

◆ **Mechanical Adjustment after reinstalling**

1) Adjustment after replacing the cylinder.



(A) REMOVE SCREW
STATIC DISCHARGE BRUSH
(B) REMOVE TWO SCREWS
IMPEDANCE ROLLER
(C) REMOVE TWO SCREWS
UPPER CYLINDER
POLE
HEAD CLEANING BRACKET ASSEMBLY

Fig. 4-3

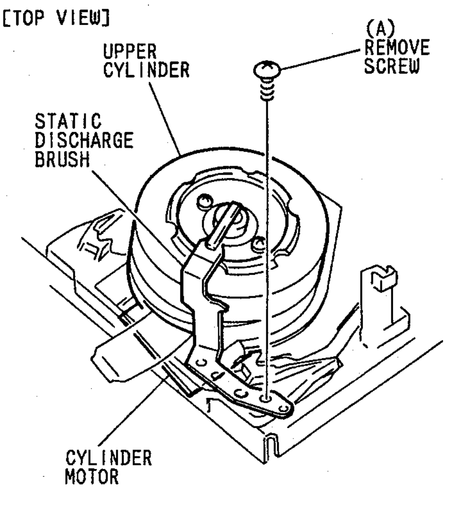
4. Cylinder Motor Assembly

◆ **Cautions during work**

1) Do not touch video head tips.

◆ **Mechanical Adjustment after reinstalling**

1) Adjustment after replacing the cylinder.



[TOP VIEW]
UPPER CYLINDER
(A) REMOVE SCREW
STATIC DISCHARGE BRUSH
CYLINDER MOTOR

Fig. 4-4 (1)

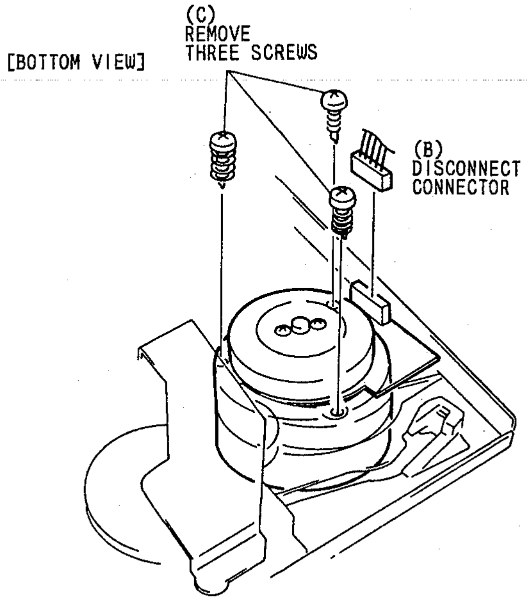

[BOTTOM VIEW]
(C)
REMOVE
THREE SCREWS
(B)
DISCONNECT
CONNECTOR

Fig. 4-4 (2)

5. Supply/Take-up Guide Rollers

◆ **Caution when reinstalling**

1) Keep the surface of the guide roller which is in contact with the tape clean.

◆ **Mechanical Adjustment after reinstalling**

1) Guide Roller Height Adjustment

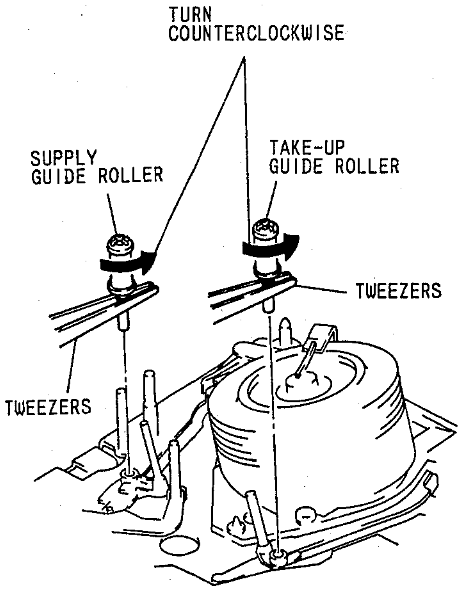

TURN
COUNTERCLOCKWISE
SUPPLY
GUIDE ROLLER
TAKE-UP
GUIDE ROLLER
TWEEZERS
TWEEZERS

Fig. 4-5

6. Tension Arm, Tension Band and Tension Drive Arm

◆ **Cautions when reinstalling**

1) Keep the surface of the tension pole which is in contact with the tape clean.
2) Insert the boss of the tension drive arm into the groove in cam gear [A]. (See Fig. 4-6)

◆ **Mechanical Adjustment after reinstalling**

1) Tension Pole Position and Tension Adjustment

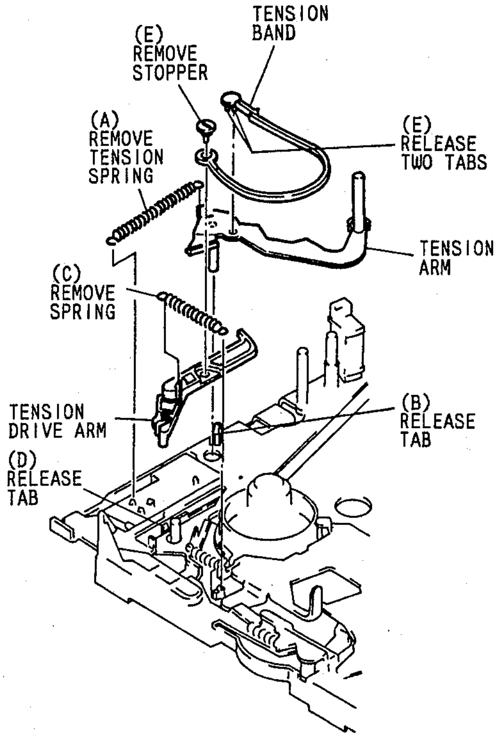

TENSION
BAND
(E)
REMOVE
STOPPER
(A)
REMOVE
TENSION
SPRING
(E)
RELEASE
TWO TABS
TENSION
ARM
(C)
REMOVE
SPRING
TENSION
DRIVE ARM
(B)
RELEASE
TAB
(D)
RELEASE
TAB

Fig. 4-6

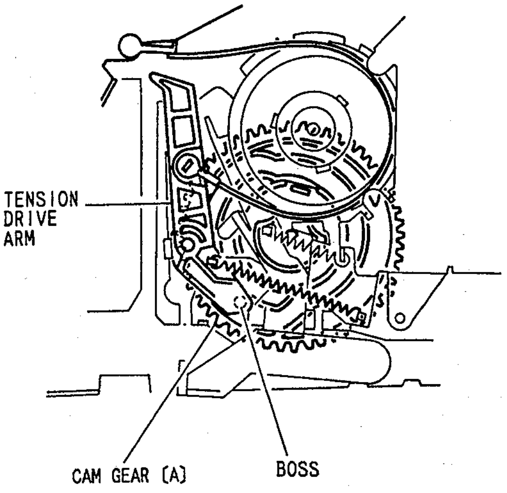

TENSION
DRIVE
ARM
CAM GEAR [A]
BOSS

Fig. 4-7

7. Safety Arm

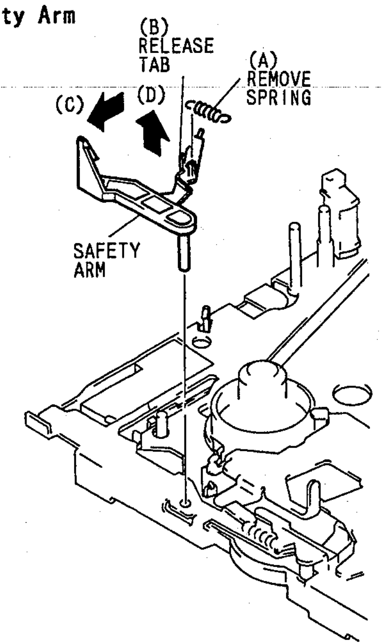

(B) RELEASE TAB
(A) REMOVE SPRING
(C)
(D)
SAFETY ARM

Fig. 4-8

8. Upper Plate, Torque Change Arm and Supply/Take-up Main Brakes

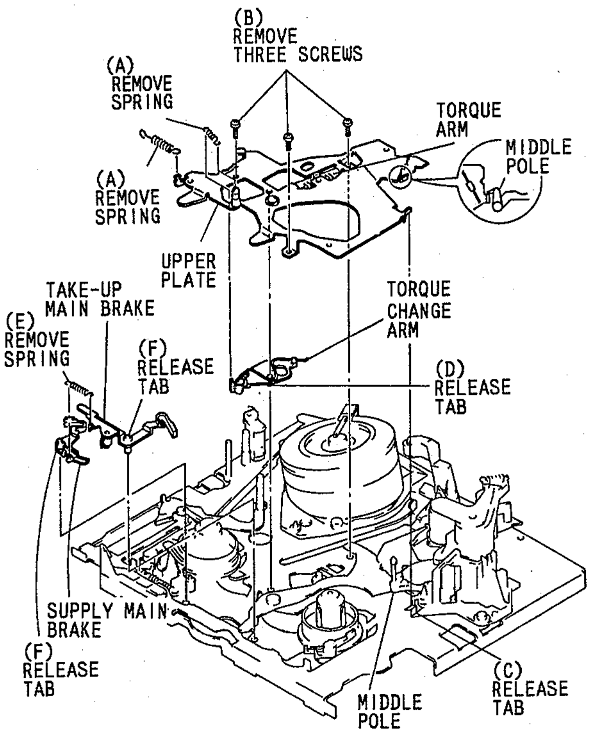

(B) REMOVE THREE SCREWS
(A) REMOVE SPRING
TORQUE ARM
MIDDLE POLE
(A) REMOVE SPRING
UPPER PLATE
TAKE-UP MAIN BRAKE
(E) REMOVE SPRING
(F) RELEASE TAB
TORQUE CHANGE ARM
(D) RELEASE TAB
SUPPLY MAIN BRAKE
(F) RELEASE TAB
MIDDLE POLE
(C) RELEASE TAB

Fig. 4-9

[Torque Arm Installation Procedure]

1) Insert the torque arm as shown in the figure.
2) Fit the torque arm to the upper plate as shown in Fig. 4-10.
3) Install the torque arm into the upper plate while turning the arm in the direction of the arrow.

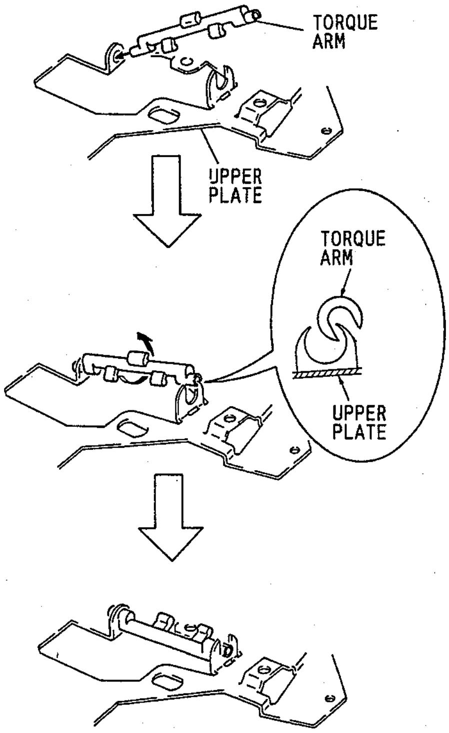

TORQUE ARM
UPPER PLATE
TORQUE ARM
UPPER PLATE

Fig. 4-10

9. Supply/Take-up Reel Disks, Supply/Take-up Sub Brakes and S-VHS Det. Switch

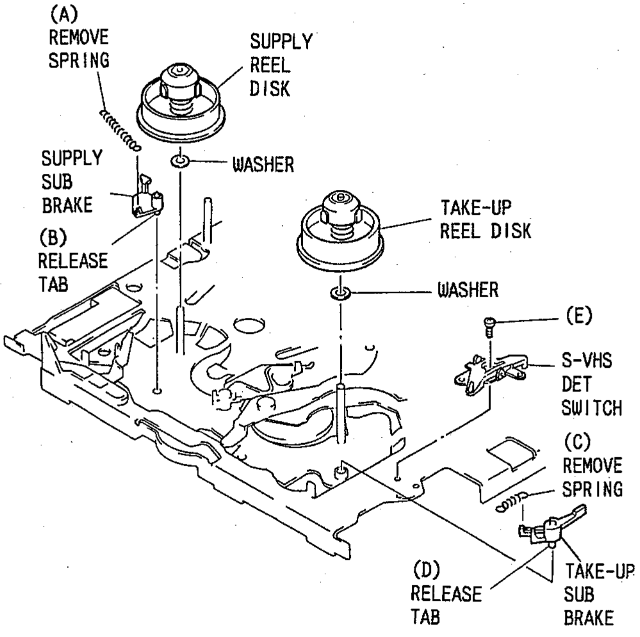

(A) REMOVE SPRING
SUPPLY REEL DISK
WASHER
SUPPLY SUB BRAKE
(B) RELEASE TAB
TAKE-UP REEL DISK
WASHER
(E)
S-VHS DET SWITCH
(C) REMOVE SPRING
(D) RELEASE TAB
TAKE-UP SUB BRAKE

Fig. 4-11

10. Pressure Roller Assembly

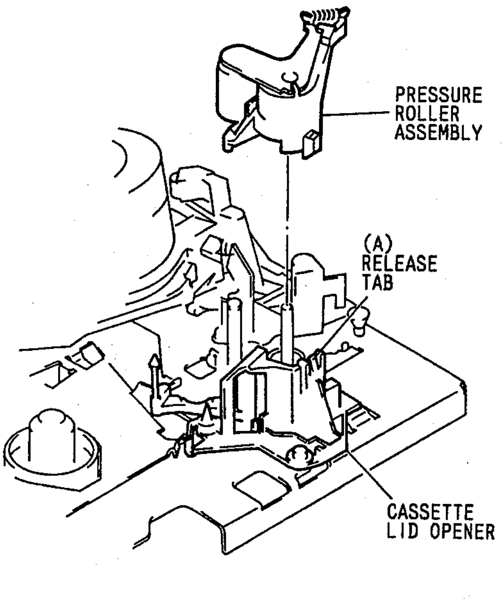

PRESSURE
ROLLER
ASSEMBLY
(A)
RELEASE
TAB
CASSETTE
LID OPENER

Fig. 4-12

11. Pressure Roller Cam Gear, Cassette Lid Opener and Middle Pole

◆ Cautions when reinstalling

1) Keep the surface of the middle pole which is in contact with the tape clean.
2) Hook the spring between the middle pole and chassis.
3) The arm of the middle pole should be in the specified position.
4) Align mark (○) on the pressure roller cam gear and mark (△) on the pressure roller drive gear. (See Fig. 4-16)

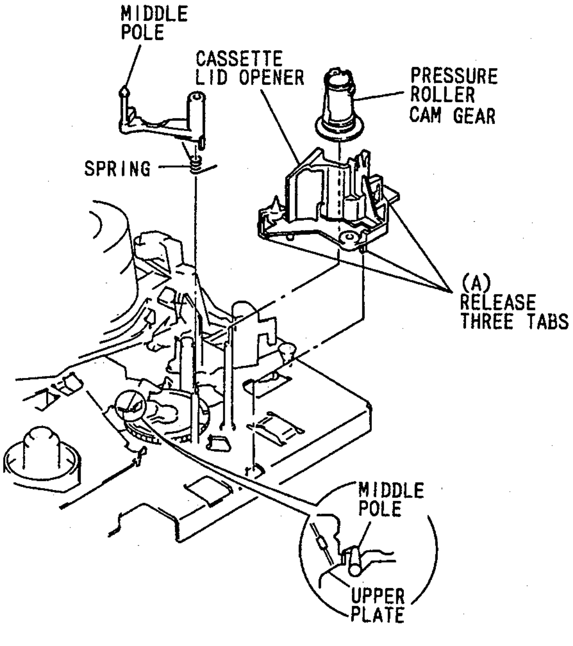

MIDDLE
POLE
CASSETTE
LID OPENER
PRESSURE
ROLLER
CAM GEAR
SPRING
(A)
RELEASE
THREE TABS
MIDDLE
POLE
UPPER
PLATE

Fig. 4-13

12. Pressure Roller Drive Gear

◆ Caution when reinstalling

1) Align hole (a) in the pressure roller drive gear and the hole in the chassis. Also align the markings on the pressure roller drive gear and arm.

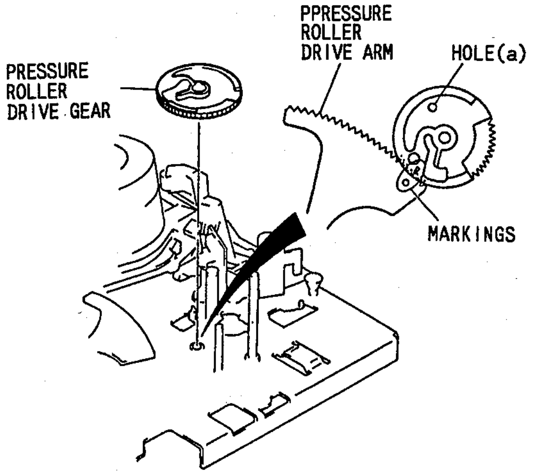

PPRESSURE
ROLLER
DRIVE ARM
HOLE(a)
PRESSURE
ROLLER
DRIVE GEAR
MARKINGS

Fig. 4-14

13. Pressure Roller Drive Arm and Fine Slow Brake Arm

◆ Cautions when reinstalling

1) Check that the boss of the pressure roller drive arm is securely inserted into the groove in cam gear [B]. (See Fig. 4-16)
2) Align hole (b) in the pressure roller drive arm and the hole in the chassis. (See Fig. 4-16)

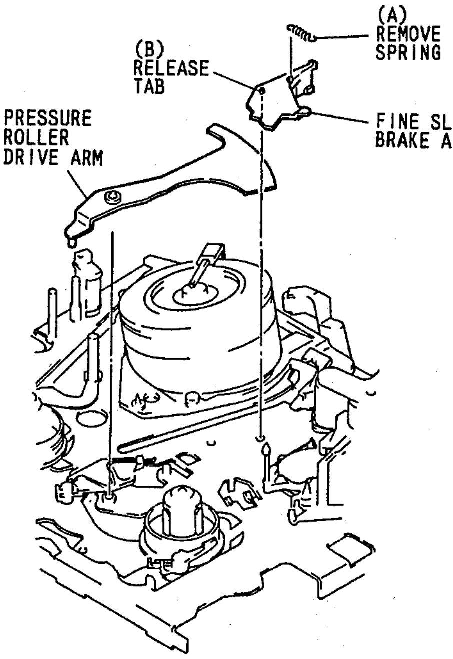

(A)
REMOVE
SPRING
(B)
RELEASE
TAB
PRESSURE
ROLLER
DRIVE ARM
FINE SLOW
BRAKE ARM

Fig. 4-15

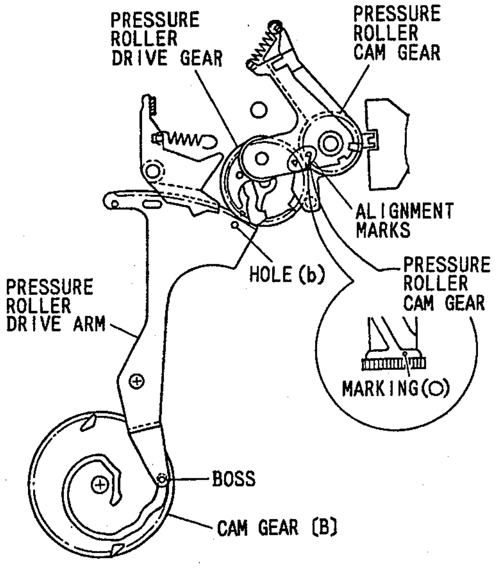

PRESSURE ROLLER DRIVE GEAR
PRESSURE ROLLER CAM GEAR
ALIGNMENT MARKS
HOLE (b)
PRESSURE ROLLER CAM GEAR
PRESSURE ROLLER DRIVE ARM
MARKING(O)
BOSS
CAM GEAR [B]

Fig. 4-16

14. Cylinder Motor Base

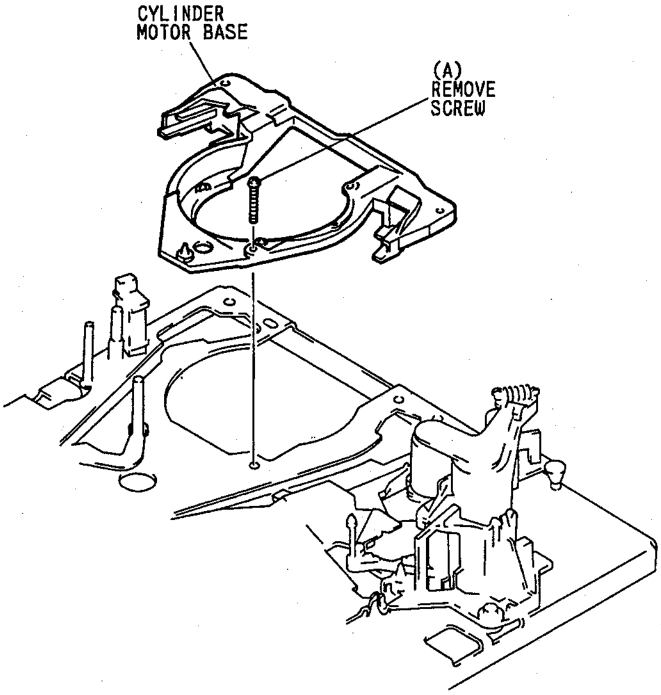

CYLINDER MOTOR BASE
(A) REMOVE SCREW

Fig. 4-17

15. Drive belt, Center Pulley and FL Relay Gear [B]

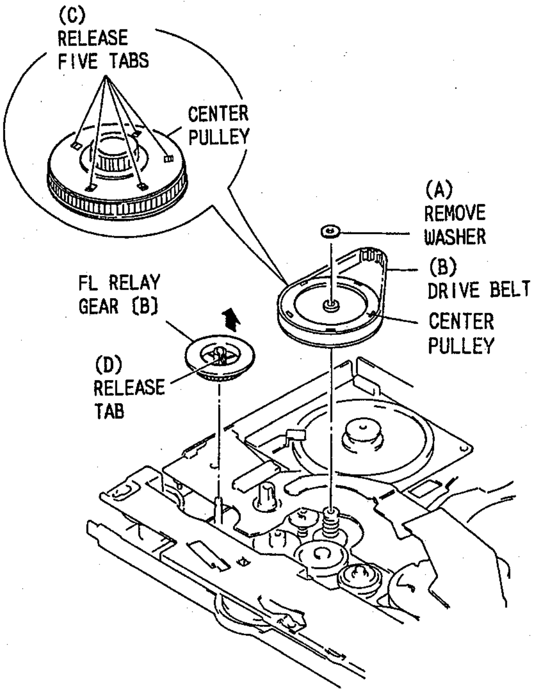

(C) RELEASE FIVE TABS
CENTER PULLEY
(A) REMOVE WASHER
(B) DRIVE BELT
CENTER PULLEY
FL RELAY GEAR [B]
(D) RELEASE TAB

Fig. 4-18

16. Capstan Motor Assembly

◆ **Caution when reinstalling**

1) Keep the surface of the capstan shaft which is in contact with the tape clean.

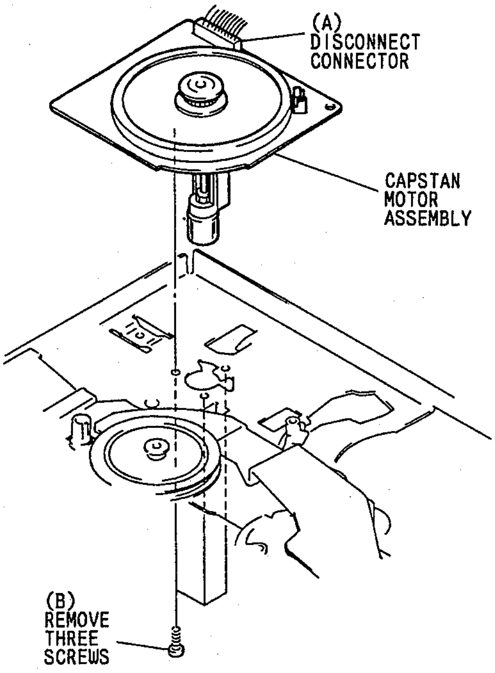

(A) DISCONNECT CONNECTOR
CAPSTAN MOTOR ASSEMBLY
(B) REMOVE THREE SCREWS

Fig. 4-19

17. Reel Drive Idler and Reel Gears L / R

◆ Caution when reinstalling
1) Install the spring between the idler and washer.

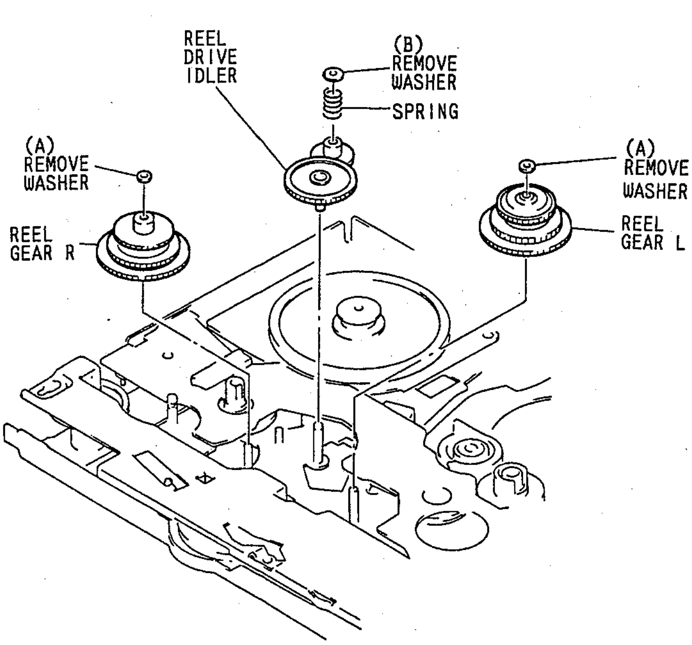

REEL DRIVE IDLER
(B) REMOVE WASHER
SPRING
(A) REMOVE WASHER
REEL GEAR R
(A) REMOVE WASHER
REEL GEAR L

Fig. 4-20

18. Roller Plate and Mode Gear

◆ Cautions when reinstalling
1) Align mark (f) on cam gear [A] and mark (e) on the mode gear. (See Fig. 4-24)
2) Align the arrow on the MWB (sensor) P.C.B and arrow (No.1) on the mechanism state switch. (See Fig. 4-24)
3) With the above conditions, align mark (c) on the mechanism state switch and mark (d) on the mode gear. (See Fig. 4-24)

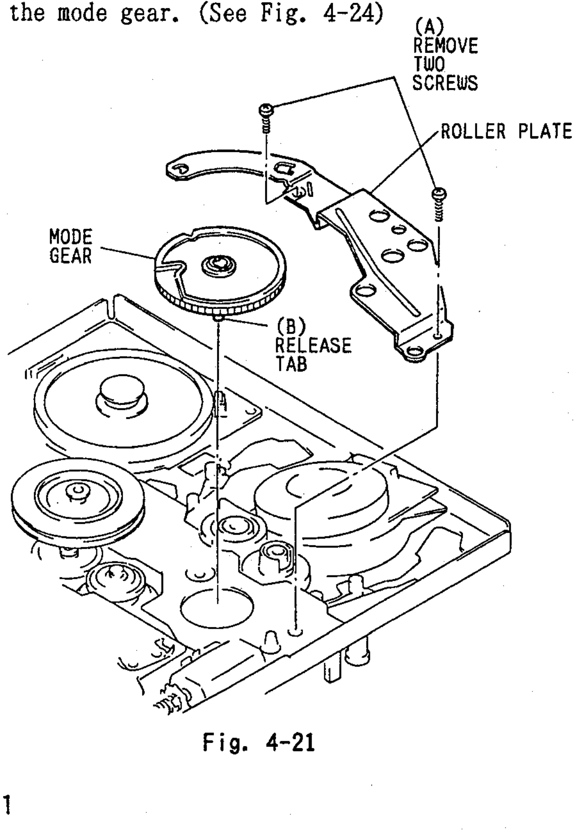

(A) REMOVE TWO SCREWS
ROLLER PLATE
MODE GEAR
(B) RELEASE TAB

Fig. 4-21

19. Sensor (MWB) Circuit Board

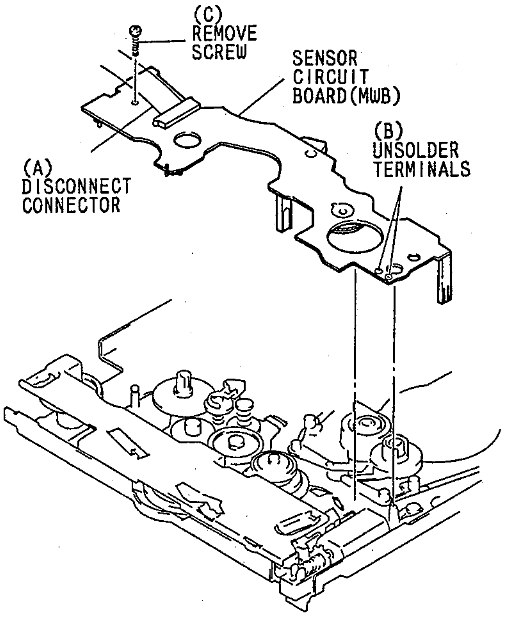

(C) REMOVE SCREW
SENSOR CIRCUIT BOARD(MWB)
(B) UNSOLDER TERMINALS
(A) DISCONNECT CONNECTOR

Fig. 4-22

20. Gear Plate, Relay Gear, Wheel Gear, Take-up Brake Sub Arm, Relay Gear [C] and Cam Gears [A] / [B]

◆ Cautions when reinstalling
1) Align hole (a) in the cam gear[A] and the hole in the chassis.
Also align mark (f) on the cam gear[A] and mark (e) on the mode gear. (See Fig. 4-24)
2) Align mark (h) on the cam gear[B] and mark (g) on the cam gear[A]. (See Fig. 4-24)
3) Check that the bosses of the supply sub brake and tension drive arm are inserted into the specified positions. (See Fig. 4-25)
4) Check that the boss of the pressure roller drive arm is inserted into the groove in the cam gear [B]. (See Fig. 4-25)

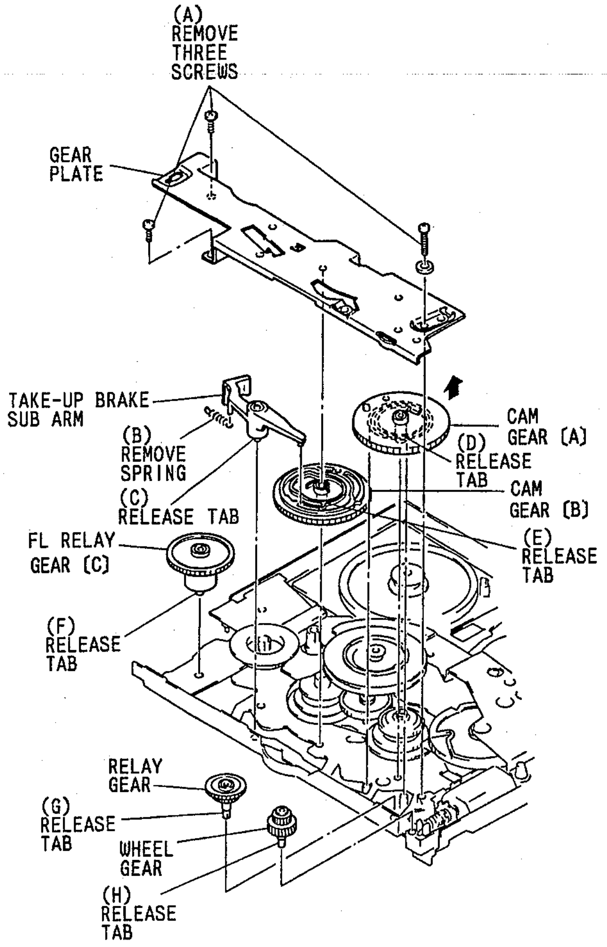

(A) REMOVE THREE SCREWS
GEAR PLATE
TAKE-UP BRAKE SUB ARM
(B) REMOVE SPRING
(C) RELEASE TAB
CAM GEAR [A]
(D) RELEASE TAB
CAM GEAR [B]
(E) RELEASE TAB
FL RELAY GEAR [C]
(F) RELEASE TAB
RELAY GEAR
(G) RELEASE TAB
WHEEL GEAR
(H) RELEASE TAB

Fig. 4-23

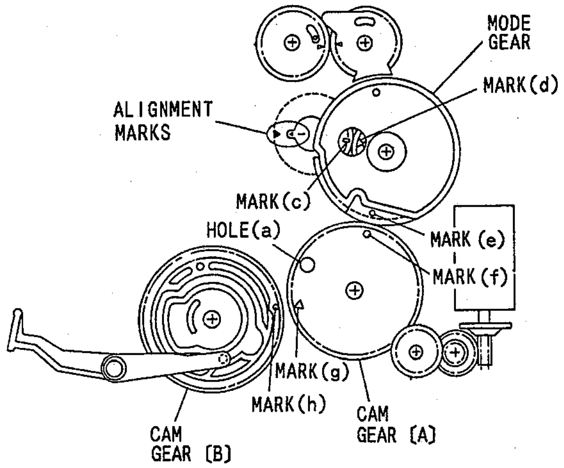

MODE GEAR
MARK(d)
ALIGNMENT MARKS
MARK(c)
HOLE(a)
MARK (e)
MARK (f)
MARK(g)
MARK(h)
CAM GEAR [A]
CAM GEAR [B]

Fig. 4-24

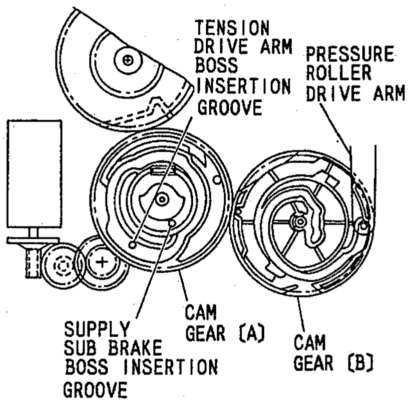

TENSION DRIVE ARM BOSS INSERTION GROOVE
PRESSURE ROLLER DRIVE ARM
SUPPLY SUB BRAKE BOSS INSERTION GROOVE
CAM GEAR [A]
CAM GEAR [B]

Fig. 4-25

21. Loarding Motor and Loarding Motor Gear

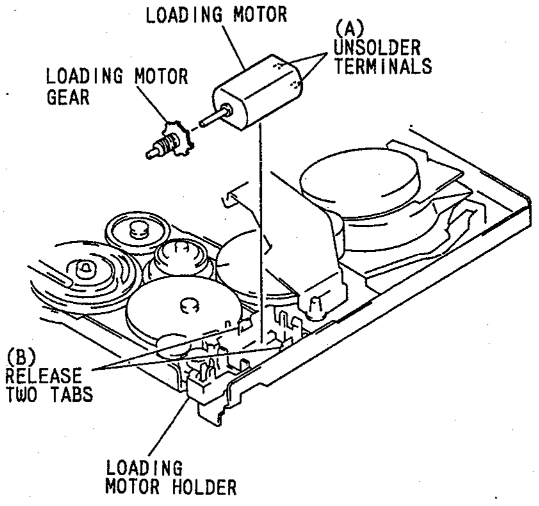

LOADING MOTOR
(A) UNSOLDER TERMINALS
LOADING MOTOR GEAR
(B) RELEASE TWO TABS
LOADING MOTOR HOLDER

Fig. 4-26

22. FL Relay Gear [A], FL Change Arm and FL Change Gear

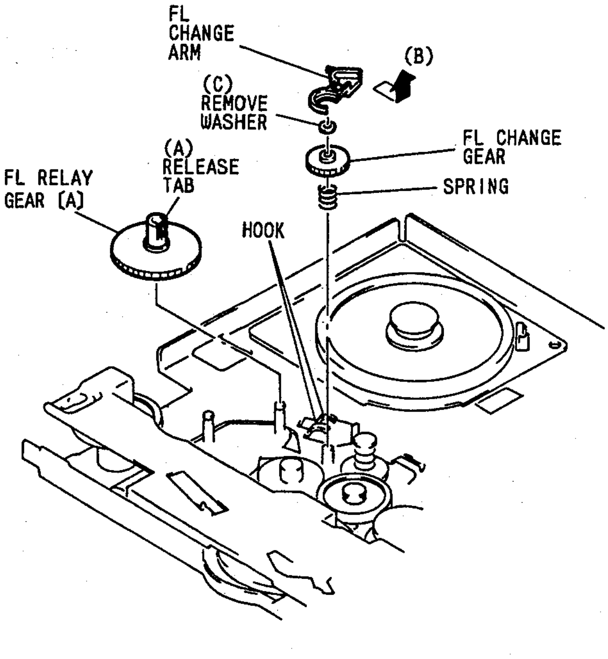

FL CHANGE ARM
(B)
(C) REMOVE WASHER
(A) RELEASE TAB
FL CHANGE GEAR
SPRING
FL RELAY GEAR [A]
HOOK

Fig. 4-27

[Cautions when reinstalling]

Install the FL change arm by the following procedure. Do not narrow the "U"-shaped section of the arm when installing it.

1) Place the arm sideways and pass it through the hole in the chassis.
2) Turn the arm to the front (to the right).
3) Push up the whole arm, taking care that section (a) of the arm does not hit the chassis and insert the bosses of the arm into the holes in the axis supports of the chassis.
4) After installing the arm, check that the arm moves smoothly.

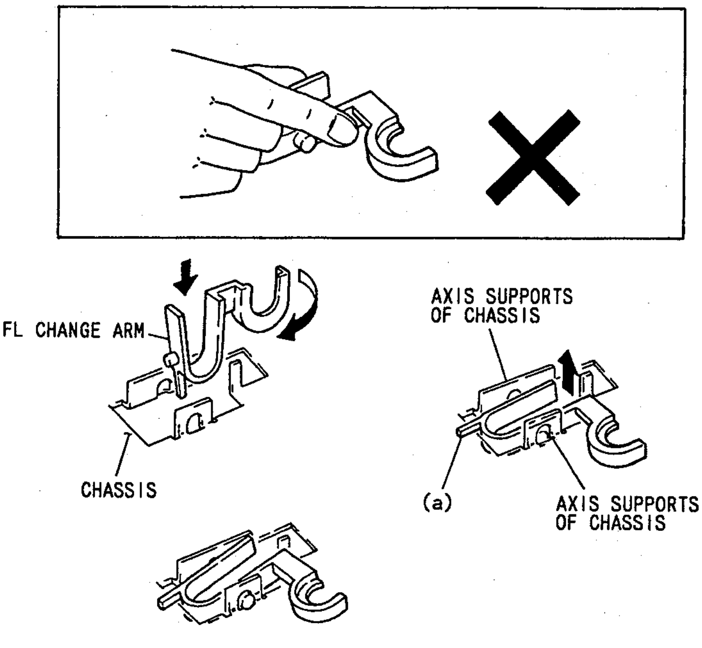

FL CHANGE ARM
CHASSIS
AXIS SUPPORTS OF CHASSIS
(a)
AXIS SUPPORTS OF CHASSIS

Fig. 4-28

23. Supply/Take-up Loading Arms and Supply/Take-up Guide Roller Bases

◆ Caution when installation

1) Align the markings. (See Fig. 4-30)

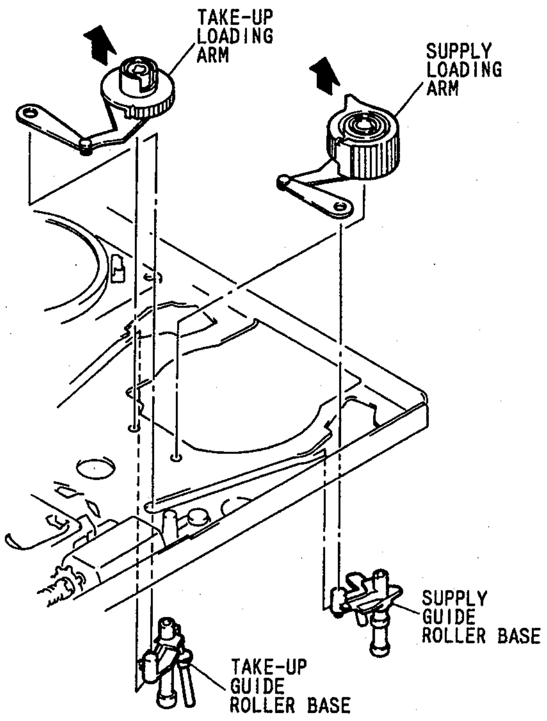

TAKE-UP LOADING ARM
SUPPLY LOADING ARM
SUPPLY GUIDE ROLLER BASE
TAKE-UP GUIDE ROLLER BASE

Fig. 4-29

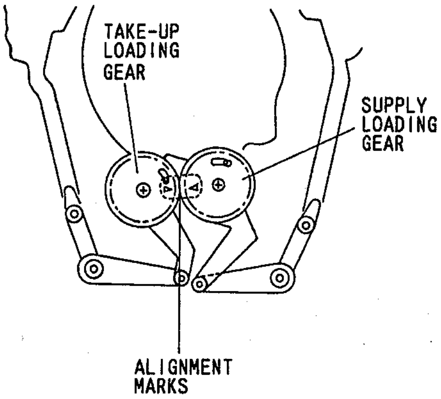

TAKE-UP LOADING GEAR
SUPPLY LOADING GEAR
ALIGNMENT MARKS

Fig. 4-30

24. Loading Motor Assembly

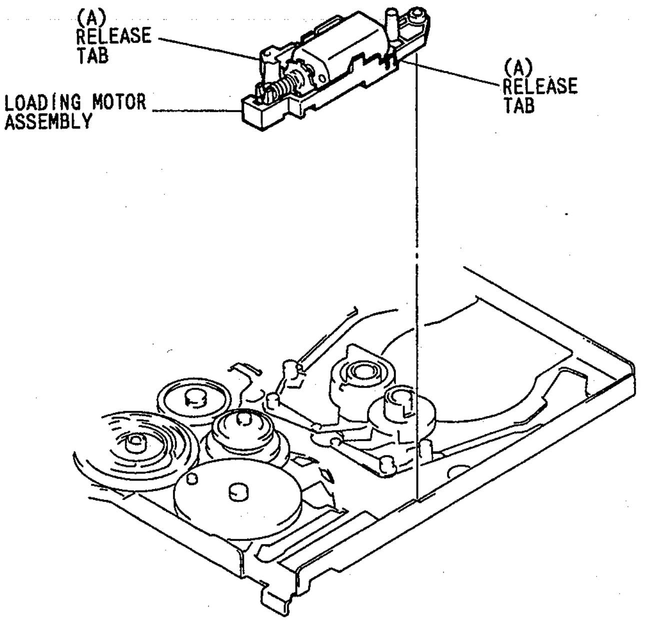
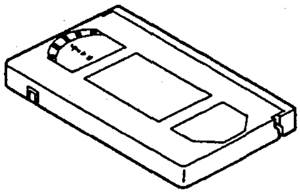
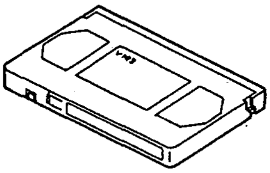
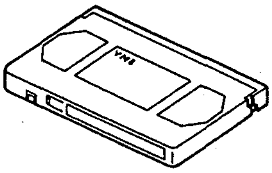
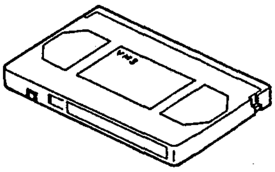
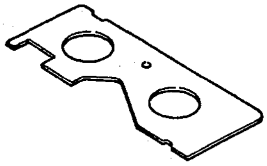
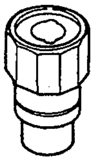
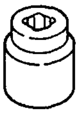
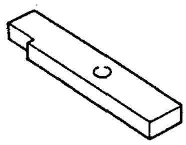
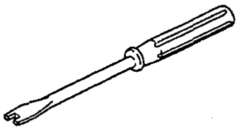

(A)
RELEASE
TAB
LOADING MOTOR
ASSEMBLY
(A)
RELEASE
TAB

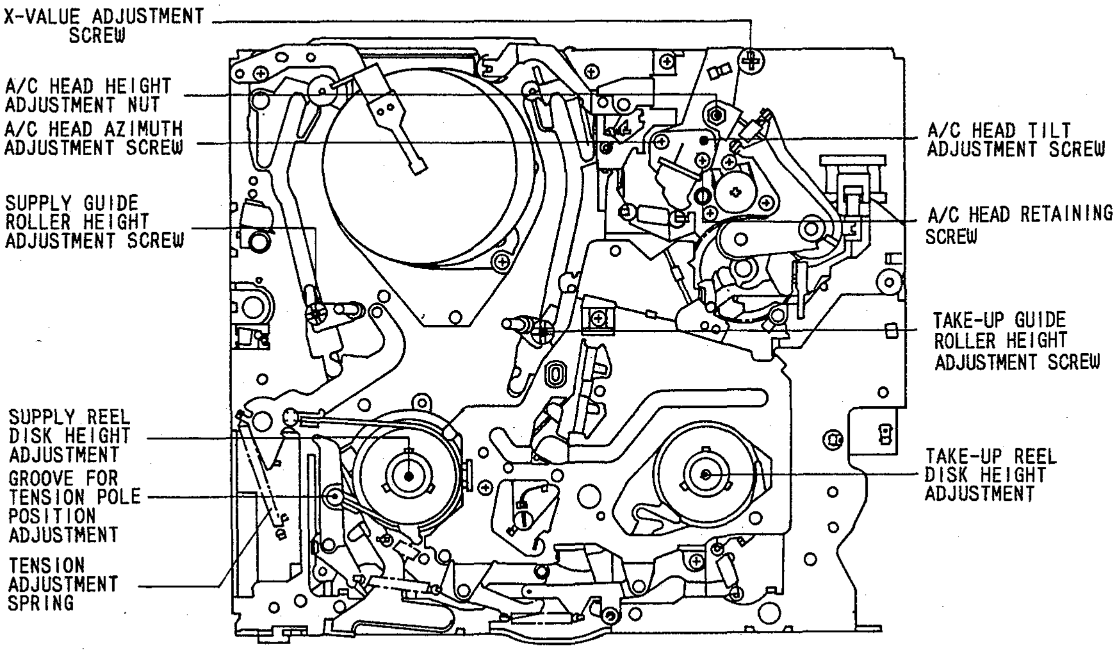
Fig. 4-31

MECHANISM ADJUSTMENT

JIGS AND TAPES FOR ADJUSTMENT

1. Back Tension Meter Part No.7099004 	2. NTSC Alignment Tape 〔For NTSC〕 Part No.7099046 	3. 30HMP2-1 Alignment Tape 〔For NTSC〕 Part No.7099089 
4. PAL Alignment Tape 〔For PAL〕 Part No.7099052 	5. Master Plane Part No.7099279 	6. Torque Gauge Part No.7099039 
7. Torque Gauge Adapter Part No.7099035 	8. Reel Disk Height Jig Part No.7099038 	9. Guide Roller Adjustment Screw-driver Part No.7069064 

ADJUSTMENT PARTS LOCATIONS


X-VALUE ADJUSTMENT SCREW
A/C HEAD HEIGHT ADJUSTMENT NUT
A/C HEAD AZIMUTH ADJUSTMENT SCREW
SUPPLY GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
SUPPLY REEL DISK HEIGHT ADJUSTMENT
GROOVE FOR TENSION POLE POSITION ADJUSTMENT
TENSION ADJUSTMENT SPRING
A/C HEAD TILT ADJUSTMENT SCREW
A/C HEAD RETAINING SCREW
TAKE-UP GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
TAKE-UP REEL DISK HEIGHT ADJUSTMENT

*-1: For X-value adjustment, refer to the chapter on electrical adjustment in the service manual of each model.

Top View of Mechanism

MECHANICAL PARTS ADJUSTMENT

1. Mechanism State Switch Adjustment

Purpose: To detect the mechanism state correctly and prevent malfunctions.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
• Blank tape	———	• Eject mode (with the cassette ejected)	• Mechanism state switch • Mode gear

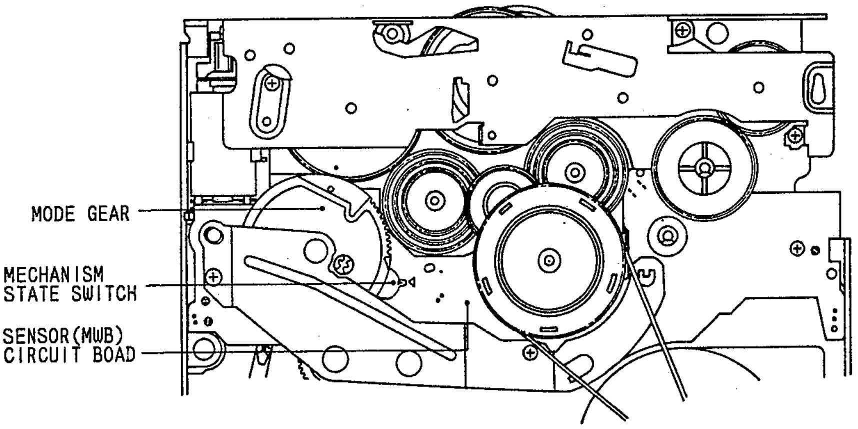
Adjustment procedure

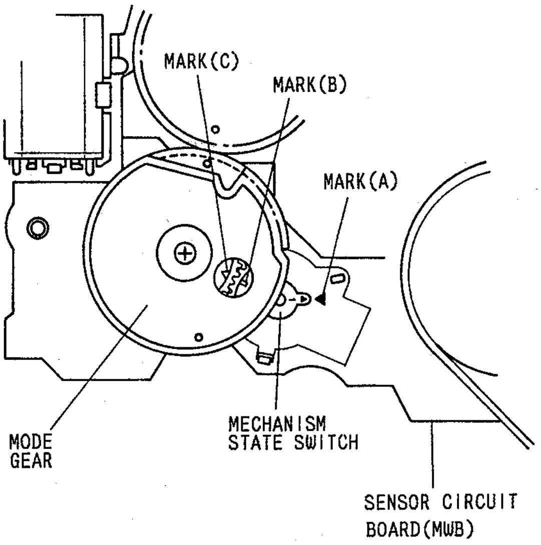
1) Check that arrow (A) on the Sensor (MWB) P.C.B and the arrow of mechanism state switch indication number 1 are aligned.

2) If the above alignment is not obtained, adjust as follows.
   1. Remove the roller plate and mode gear. (See "AF MECHANISM COMPONENTS REMOVAL" in CHAPTER 1.)
   2. Turn the mechanism state switch through the hole in the Sensor (MWB) P.C.B to align arrow (A) on the Sensor (MWB) P.C.B and the arrow of mechanism state switch indication number 1.
   3. Reinstall the mode gear so that mark (B) on the mechanism state switch and mark (C) on the mode gear are aligned.

3) Load a blank tape and perform various operations to check that loading and unloading are performed correctly.

Adjustment diagram


MODE GEAR
MECHANISM STATE SWITCH
SENSOR(MWB) CIRCUIT BOAD


MARK(C)
MARK(B)
MARK(A)
MODE GEAR
MECHANISM STATE SWITCH
SENSOR CIRCUIT BOARD(MWB)

TAPE TRANSPORT SYSTEM PARTS ADJUSTMENT

The tape transport system is the path from the supply reel disk passing through the video heads to the take-up reel disk. The transport system parts, especially the parts which directly come into contact with a tape, should be kept clean without scratches, dust, oil, etc.
The tape transport system has been adjusted before the unit is shipped from the factory. Therefore, when parts in the transport system are replaced, the transport system is stabilized by only adjusting the new parts correctly.

1. Reel Disk Height Adjustment

Purpose: To set the reels of the cassette to the specified height, thus determining the height of tape.

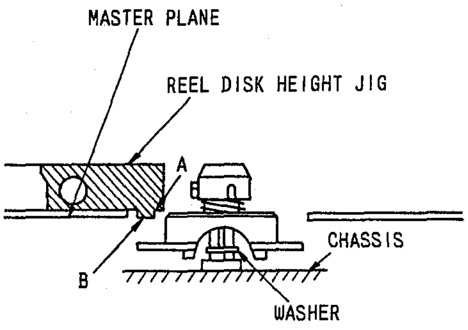
Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
• Master plane (Parts No.7099279) • Reel disk height jig (Parts No.7099038)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	——	• Washers in the supply and take-up reel disks

Adjustment procedure
1) Check that the reel disk is between sections A and B of the reel disk height jig.
2) If the disk is not between sections A and B of the jig, replace the washers (0.5mm thick) in the reel disk or adjust them.

[Replacement Method]
1) Remove the tension arm and tension band.
2) Remove the upper plate.
3) Remove the supply or/and take-up main brakes.
4) Remove the supply or/and take-up sub brakes.
5) Lift the reel disk(s) and replace the washers or adjust their number.

[Caution]
When the tension arm and tension band are removed, adjust the tension pole position and tension after reinstalling them.

Adjustment diagram



2. Tension Pole Position and Tension Adjustment

Purpose: To make the tension of tape constant so that the contact between the video heads and tape is stabilized.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
Position adjustment ———	———	1) Remove the top cover. 2) Set the VCR to the loading state without inserting a cassette. (See page 2-9)	Position adjustment: Groove for tension position adjustment
Tension adjustment • Back Tension Meter (Part No.7099004)	———	Tension adjustment 3) Play the back-tension meter.	Tension adjustment: Tension spring hooking position

Adjustment procedure

- Position Adjustment -

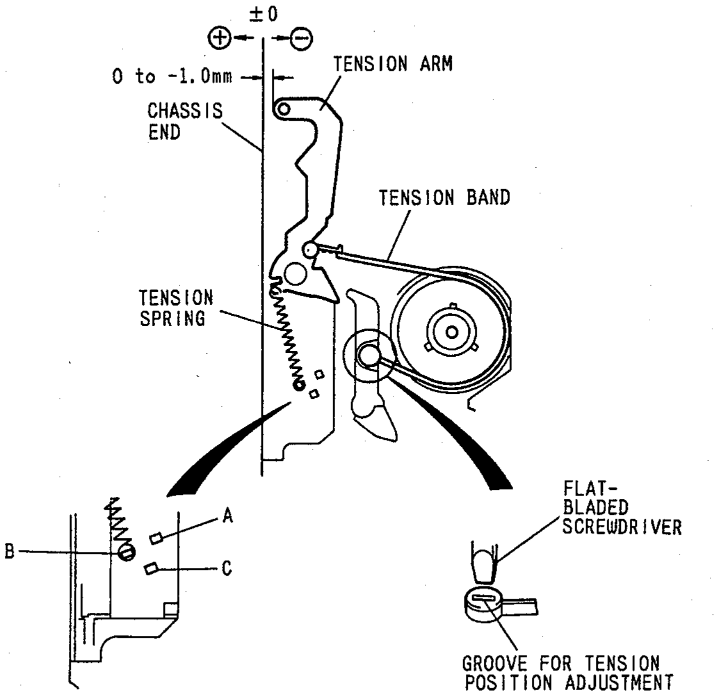
1) Hook the tension spring to position (B).
2) Insert a flat-bladed screwdriver into the groove for the tension position adjustment and set the clearance between the tesion arm and chassis end to 0 to -1.0mm.
3) After adjustment is completed, perform loading without inserting a cassette and recheck the tension pole position.

- Tension Adjustment -

1) Hook the tension spring to position (B).
2) Changing the tension arm position with this adjustment varies the back-tension torque value. Check the tension arm position without loading a tape and then play the back-tension meter to check that the torque is as follows.
   - When the tension arm is positioned -0.5mm to -1mm from the chassis:
     Reading of Back-Tension Meter: 28 to 36 g-cm (reference value)
   - When the tension arm is positioned ±0 mm to -0.5mm from the chassis:
     Reading of Back-Tension Meter: 25 to 32 g-cm (reference value)
3) If the reading is higher than the reference, move the spring to position (A).
   If the reading is lower than the reference, move the spring to position (C).

Caution: If the tension torque value has been drifted greatly (more than 6 g-cm) from the reference, recheck the tension pole position. If it is drifted, readjust the tension pole position and tension.

Adjustment diagram



3. Guide Roller Height Adjustment

Purpose: To regulate the height of tape so that the bottom of tape runs along the tape guide line on the cylinder.

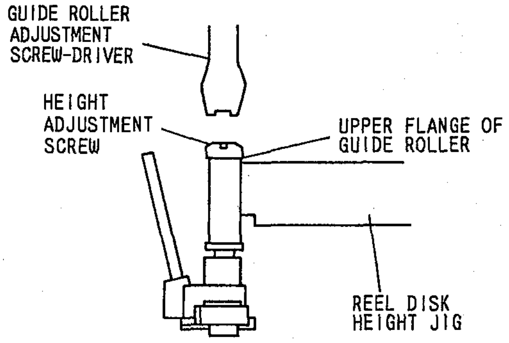
Coarse Adjustment

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
• Master plane (Part No.7099279) • Reel disk height jig (Part No.7099038) • Adjustment screw-driver (Part No.7069064)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	—	Height adjustment screws on the supply and take-up guide rollers

Adjustment procedure

1) Align the bottom of the guide roller's upper flange and the top of the reel disk height jig.
2) Perform the precise adjustment continuously.

Adjustment diagram


GUIDE ROLLER ADJUSTMENT SCREW-DRIVER
HEIGHT ADJUSTMENT SCREW
UPPER FLANGE OF GUIDE ROLLER
REEL DISK HEIGHT JIG

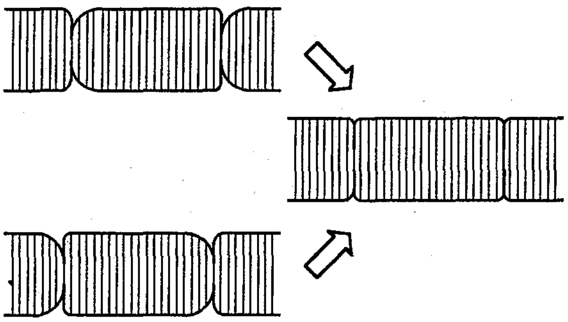
Precise Adjustment

Test equipment/jig	Test equipment connection points	State of VCR	Adjustment points
• Oscilloscope	• CH-1: PB FM • CH-2: SW25Hz or 30Hz	• Play alignment tape (Color bars section)	• Guide roller height adjustment screws
• Alignment tape	—		

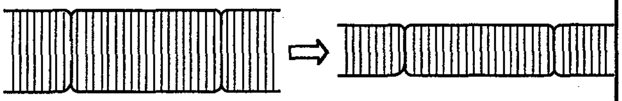
Adjustment procedure

1) Play the alignment tape: Autotracking operation (when this adjustment is performed after the cylinder has been replaced, set the tracking so that the FM output is maximum.)
2) Height adjustment screw : Flatten the FM envelope.
3) Press the tracking control up and down buttons.
4) Check that the FM drops at the start and end of FM envelope are uniform.

Waveforms



Turn the guide roller height adjustment screw slightly to flatten the waveform.



Autotracking mode

Press the tracking control buttons.

4. Audio / Control (A/C) Head Adjustment

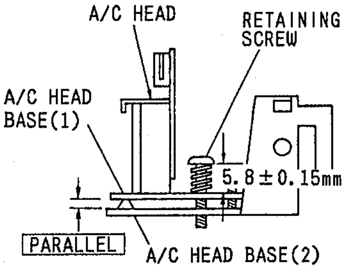
Purpose: To keep the contact between the tape and head even so the specified track is recorded and played back.

Coarse Adjustment

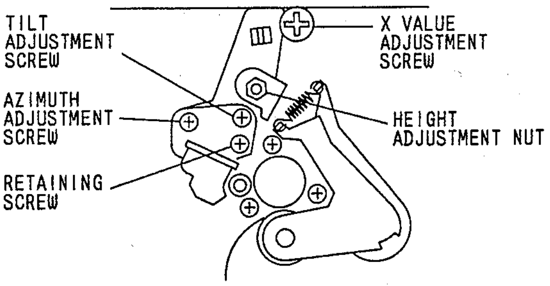
Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
• Blank tape	———	• Run the blank tape.	• A/C head retaining screw • Azimuth adjustment screw • Height adjustment nut • Tilt adjustment screw

Adjustment procedure/adjustment diagrams

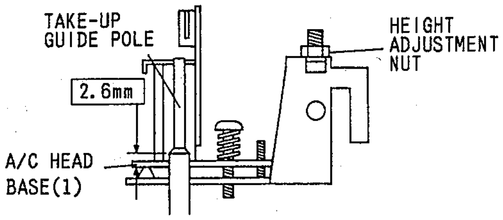
1) A/C head retaining screw: Check that the spring section of the A/C head retaining screw protrudes 5.8±0.15mm over the top of head base (1).


A/C HEAD
RETAINING SCREW
A/C HEAD BASE(1)
5.8±0.15mm
PARALLEL
A/C HEAD BASE(2)

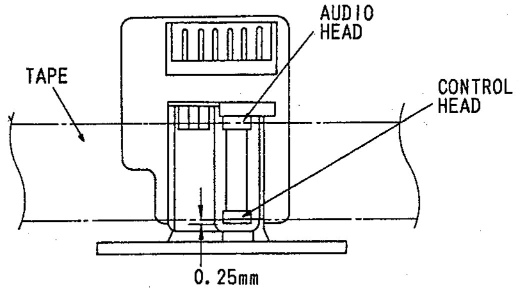
2) Tilt adjustment screw and azimuth adjustment screw : Make head bases (1) and (2) parallel.


TILT ADJUSTMENT SCREW
X VALUE ADJUSTMENT SCREW
AZIMUTH ADJUSTMENT SCREW
HEIGHT ADJUSTMENT NUT
RETAINING SCREW

3) Height adjustment nut: Adjust the height of A/C head base (1) so that its top surface is approx. 2.6 mm lower than the bottom flange of the take-up guide pole.


TAKE-UP GUIDE POLE
HEIGHT ADJUSTMENT NUT
2.6mm
A/C HEAD BASE(1)

4) Load a blank tape and set the VCR to the play mode.
5) Check that there is no conspicuous curling and riding over of tape around the A/C head. If there is conspicuous curling or riding over, readjust the tilt adjustment screw, azimuth adjustment screw and height adjustment nut. When the bottom edge of tape is 0.25 mm from the bottom edge of the control head's core, the height of A/C head is ideal.


AUDIO HEAD
TAPE
CONTROL HEAD
0.25mm

6) Perform the precise adjustment continuously.

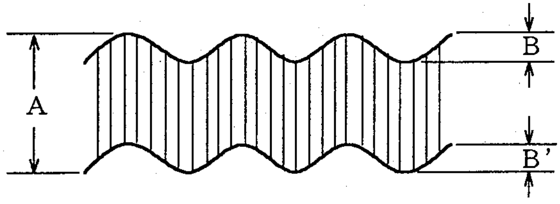
Precise Adjustment

Test equipment/jig	Test equipment connection point	State of VCR	Adjustment points
• Oscilloscope	• AUDIO OUT Jack	• Play alignment tape (Stairsteps section)	• Azimuth adjustment screw • Height adjustment nut • Tilt adjustment screw
• Alignment tape	———		

Adjustment procedure

1) Adjust the azimuth adjustment screw, height adjustment nut and tilt adjustment hexagonal screw slightly and alternately: Make the audio output maximum and flat (minimum fluctuations).

Waveform diagram



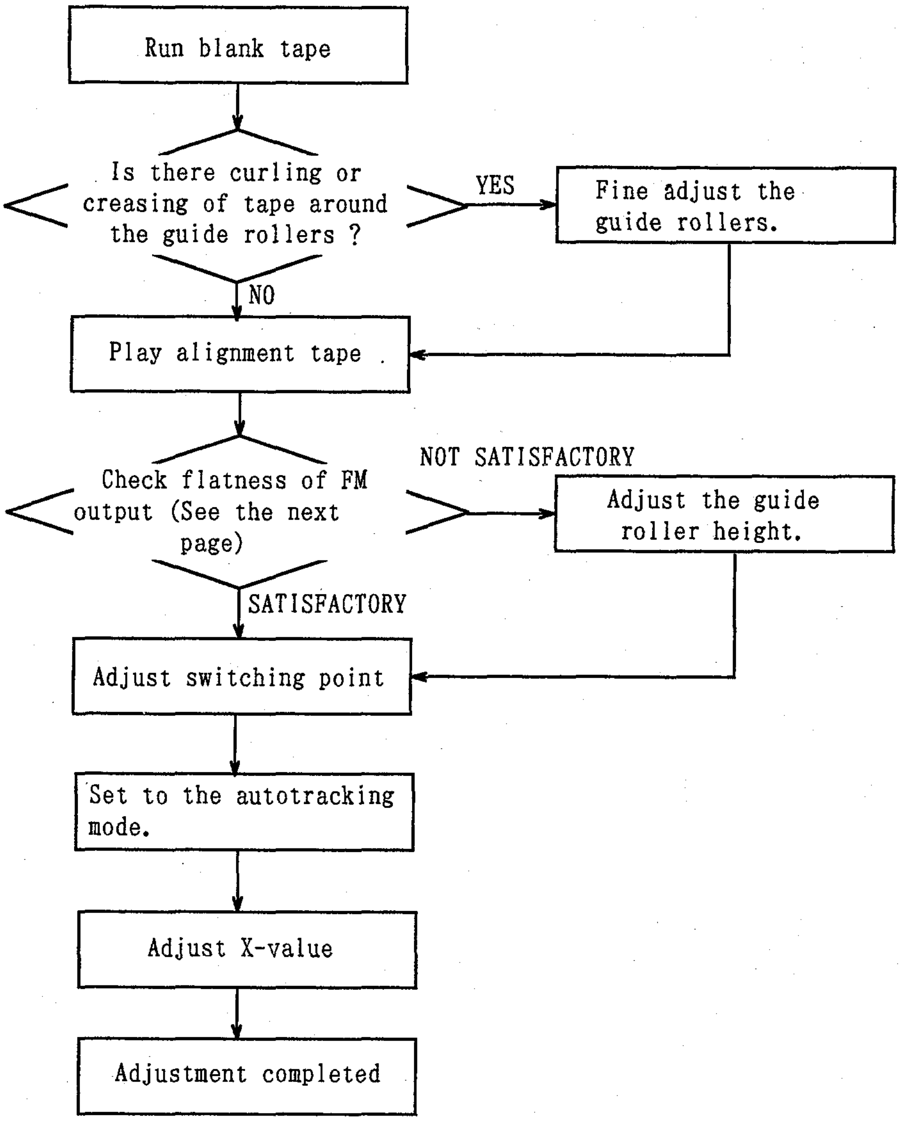
A: Maximum BB': Minimum

5. Adjustments After Replacing Cylinder

Purpose: To eliminate drift in the height relative to the guide rollers and drift in the X value, etc. However, these drifts should be minimum if the cylinder is replaced correctly.

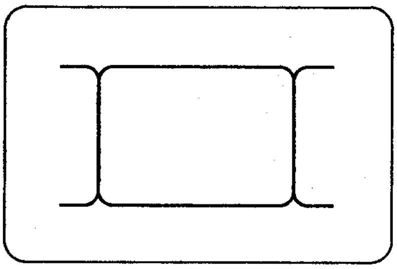
Test equipment/jig	Test equipment connection points	State of VCR	Adjustment points
• Oscilloscope	• CH-1: PB FM • CH-2: SW25Hz or 30Hz	• Run the blank tape	• Guide rollers (precise adjustment on page 2-5)
• Alignment tape	—	• Play alignment tape (Stairsteps section)	[Electrical adjustment] • Head switching point • X-value
• Blank tape	—		

Adjustment procedure

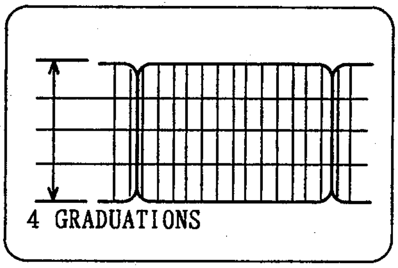

Run blank tape
Is there curling or creasing of tape around the guide rollers ?
YES
Fine adjust the guide rollers.
NO
Play alignment tape
Check flatness of FM output (See the next page)
NOT SATISFACTORY
Adjust the guide roller height.
SATISFACTORY
Adjust switching point
Set to the autotracking mode.
Adjust X-value
Adjustment completed

Checking procedure of the flatness and fluctuations of FM output and waveform diagrams

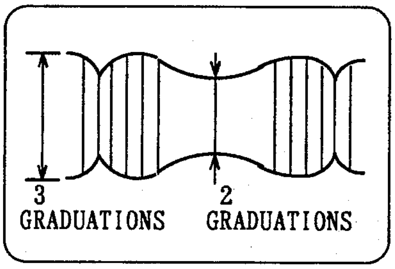
1) Set to the autotracking mode.



2) Fine tune the voltage level range of the oscilloscope to set the FM output to 4 graduations.



3) Adjust the tracking to set the maximum amplitude of the FM output to 3 graduations.
4) Check that the minimum amplitude is more than 2 graduations.



5) Check that the level fluctuations between the maximum and minimum amplitudes are less than 13%.

6. Tension/Torque Checks

Purpose: It is necessary to check the tension, torque and compression force at the tape take-up section and moving section to make the tape running smooth and satisfy the basic performance of the VCR. Check these if the tape running is not smooth or the tape speed is abnormal.

Test equipment/jigs	State of VCR
• Torque gauge • Torque gauge adapter	• Set the VCR to each operation mode without inserting a cassette. (See page 2-9)

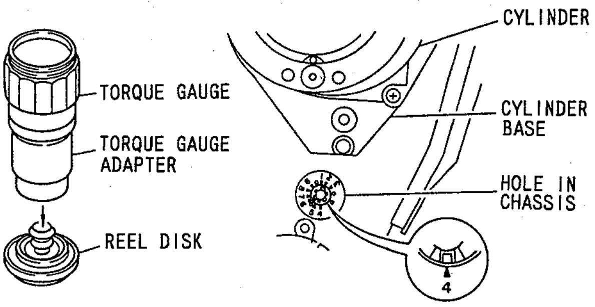
Item	VCR operation mode	Measured reel	Measured value
Main brake torque	Stop (Note)	Supply & take-up reels	100 ~ 250 g·cm
Slack removal torque	Unloading	Supply reel	120 ~ 250 g·cm
Fast forward torque	Fast forward	Take-up reel	400 g·cm or more
Rewind torque	Rewind	Supply reel	400 g·cm or more
Take-up torque	Play	Take-up reel	40 ~ 70 g·cm
Back-tension torque	Fast forward/Rewind	Supply and take-up reel	3 ~ 13 g·cm
Reverse torque	Reverse	Supply reel	160 ~ 350 g·cm
Reverse play torque	Reverse play	Supply reel	160 ~ 250 g·cm
Slow torque	Slow	Take-up reel	25 ~ 70 g·cm

Checking method

Place the torque gauge and torque gauge adapter on the reel disk and hold the torque gauge with your fingers.

Note : To fit the main brakes to the supply and take-up reel disks, set the VCR to the loading state without loading a cassette and wait for one minute in the LOADING-STOP mode.
The mechanism state switch will be shifted from indication "6" to "4". Check that the main brakes are engaged with the reel disks in this condition and then perform measurement.

Adjustment diagram



Mechanism Operation Check

Check the mechanism operation after dismantling and adjusting the mechanical block.
Check the operation after setting the mechanism to the loading state without loading a cassette.
If the mechanism does not operate normally, recheck the components and sections related to the area of the abnormality.

1. Method to set the VCR to the loading state without loading a cassette

Unplug the power cord from the AC outlet.

↓

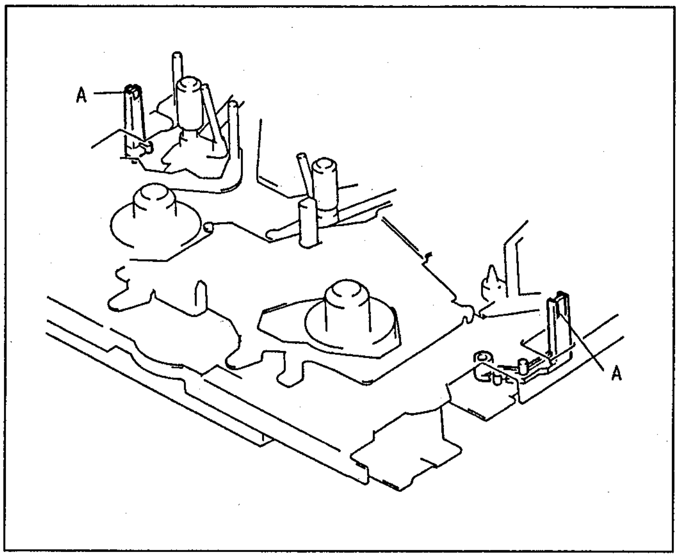
Remove the top cover and front panel.

↓

Remove the cassette loading mechanism.

↓

Cover the end sensors (sections A in the figure on the right) with black masking tape, etc. to shut off the light.



↓

Plug the power cord into an AC outlet again and turn the VCR on.

↓

The cylinder rotates and the guide rollers are set to the loading state. The VCR stands by in the LOADING-STOP mode (the mode switch is positioned at 6). *-1

→ Proceed to the operation check on the next page.

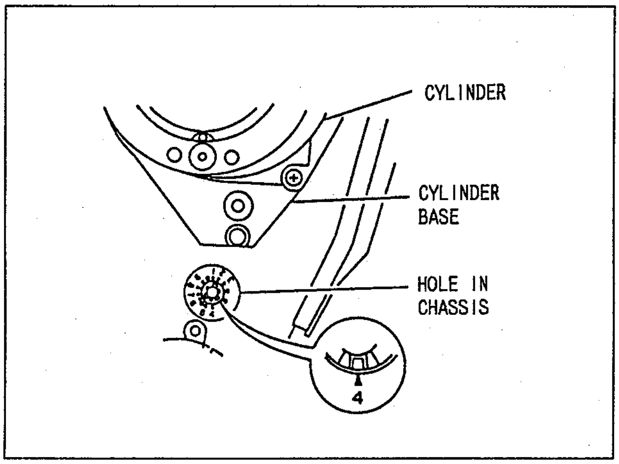
↓

When the stop mode continues for one minute, the pressure roller and tension arm will no longer be pressed (the mode switch is positioned at 4). After five more minutes, the cylinder is stopped.

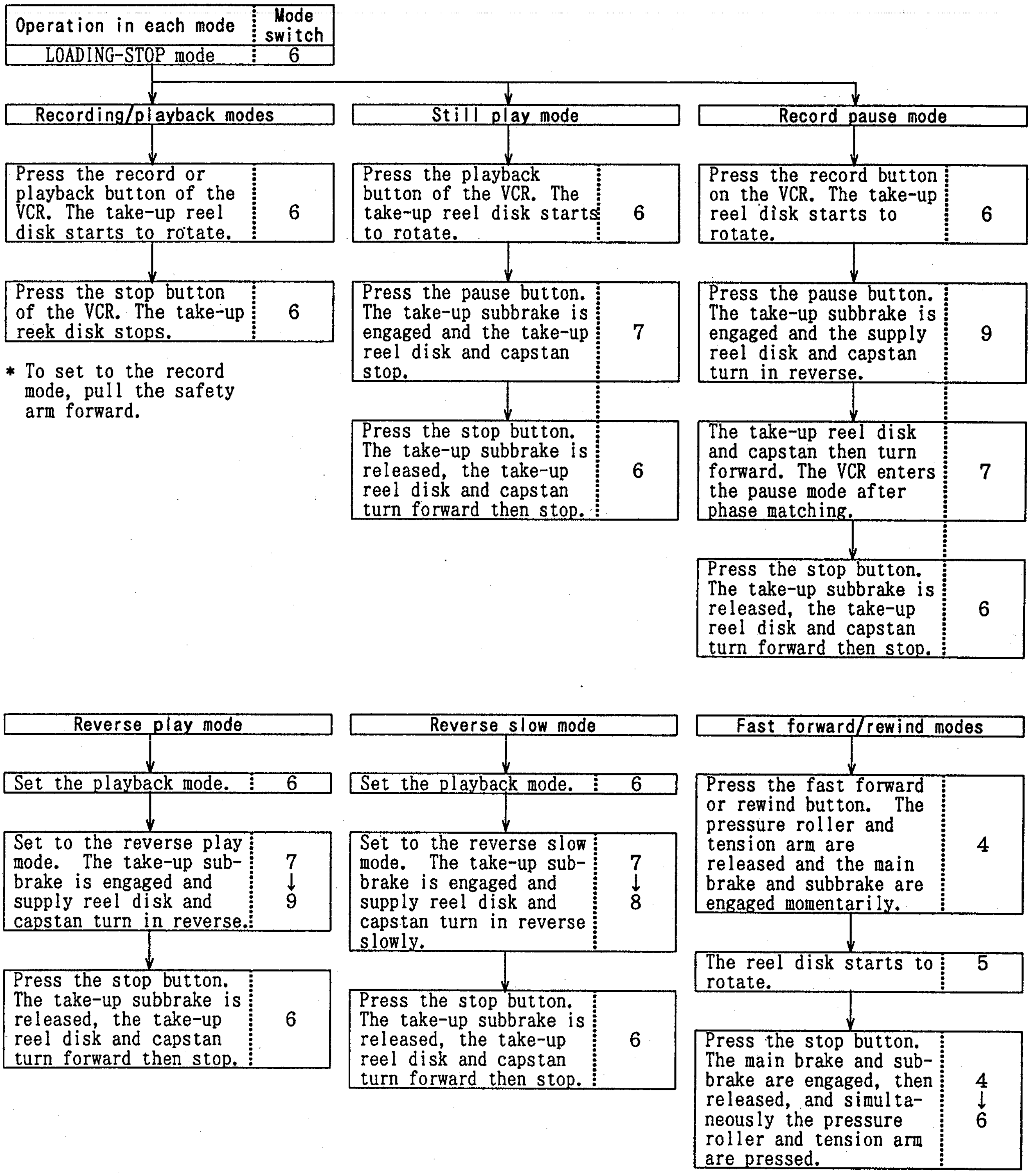
*-1: The VCR can accept the inputs of each mode in this state. However, rewinding can be done for no more than several seconds and the power is shut off because the take-up reel disk is in the stop state and reel pulses cannot be detected. Rotate the take-up reel disk manually for the rewind operation.

[Method to check the position of the mode switch]

View the mechanism state switch through the hole in the chassis in front of the cylinder. Check the mode position by observing the arrow number on the mechanism state switch aligned with the groove in the switch shaft.
For a model that does not have a circuit board at the bottom of the mechanism, check the mechanism state switch mode number directly from the bottom.



2. Checking the operation in each mode



Operation in each mode	Mode switch
LOADING-STOP mode	6

Recording/playback modes

Operation in each mode	Mode switch
Press the record or playback button of the VCR. The take-up reel disk starts to rotate.	6
Press the stop button of the VCR. The take-up reek disk stops.	6

* To set to the record mode, pull the safety arm forward.

Still play mode

Operation in each mode	Mode switch
Press the playback button of the VCR. The take-up reel disk starts to rotate.	6
Press the pause button. The take-up subbrake is engaged and the take-up reel disk and capstan stop.	7
Press the stop button. The take-up subbrake is released, the take-up reel disk and capstan turn forward then stop.	6

Record pause mode

Operation in each mode	Mode switch
Press the record button on the VCR. The take-up reel disk starts to rotate.	6
Press the pause button. The take-up subbrake is engaged and the supply reel disk and capstan turn in reverse.	9
The take-up reel disk and capstan then turn forward. The VCR enters the pause mode after phase matching.	7
Press the stop button. The take-up subbrake is released, the take-up reel disk and capstan turn forward then stop.	6

Reverse play mode

Operation in each mode	Mode switch
Set the playback mode.	6
Set to the reverse play mode. The take-up sub-brake is engaged and supply reel disk and capstan turn in reverse.	7 ↓ 9
Press the stop button. The take-up subbrake is released, the take-up reel disk and capstan turn forward then stop.	6

Reverse slow mode

Operation in each mode	Mode switch
Set the playback mode.	6
Set to the reverse slow mode. The take-up sub-brake is engaged and supply reel disk and capstan turn in reverse slowly.	7 ↓ 8
Press the stop button. The take-up subbrake is released, the take-up reel disk and capstan turn forward then stop.	6

Fast forward/rewind modes

Operation in each mode	Mode switch
Press the fast forward or rewind button. The pressure roller and tension arm are released and the main brake and subbrake are engaged momentarily.	4
The reel disk starts to rotate.	5
Press the stop button. The main brake and sub-brake are engaged, then released, and simultaneously the pressure roller and tension arm are pressed.	4 ↓ 6

After completing the check, be sure to reset the VCR to the original state by the following procedure.

1) Turn the VCR off.
2) Remove the masking tape, etc. from the supply and take-up end sensors.
3) Unplug the power cord from the AC outlet.
4) Install the cassette loading mechanism to complete the work.

How to Remove a Cassette Left in the Mechanism

If the cassette cannot be ejected due to a malfunction of the mechanism, remove it by the following procedure.

[Work procedure]

1. Remove the top and bottom covers.
2. Remove the front panel.

The tape is entangled round the cylinder.

The tape is pulled out midway and is slack.

Turn the loading motor counterclockwise in the direction of the arrow (as shown) to shift the guide rollers to the unloading state.

Turn the capstan flywheel counterclockwise at the same time to house the tape in the cassette (taking care not to damage the tape).

Turn the loading motor counterclockwise again to set it to the unloading state (turn the motor all the way).

The tape does not come out of the cassette.

Turn the loading motor in the direction of the arrow to set it to the loading state (turn the motor all the way).

Turn the capstan flywheel counterclockwise to eject the cassette from the cassette loading mechanism.

Complete

The cassette is not ejected from the cassette loading mechanism even when the center pulley is turned.

Check the linked rotation of FL relay gears [A], [B] and [C] (check that there are no foreign objects or damage).

Check the linked rotation of the FL relay gears with FL gears [B] and [A] of the cassette loading mechanism (check that there are no foreign objects or damage).

Complete

If FL gear [A] does not turn, remove the cassette loading mechanism, then remove the gear bracket from the mechanism and turn FL gear [A] to eject the cassette.

Complete

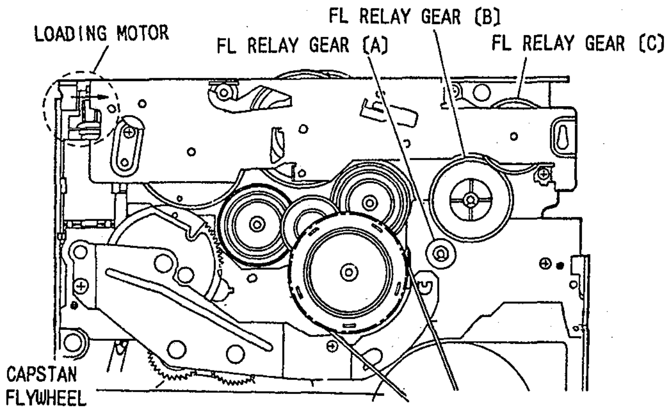


Fig. 1

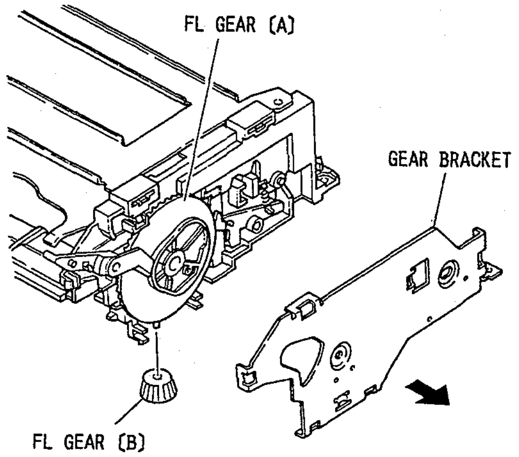


Fig. 2

CHAPTER 3

MAINTENANCE AND INSPECTION

1. Necessity of Maintenance and Inspection

The recording density of a VCR is much higher than that of an audio recorder. A VCR uses very precise components to ensure compatibility with other VCRs. If any of mechanical components are worn or dirty, the symptoms will be the same as if the VCR malfunctions.
To ensure a good picture, it is necessary to clean and lubricate the mechanism periodically and replace worn-out components.

2. Scheduled Maintenance and Inspection

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR and the environment in which the VCR is used. But, in general home use, a good picture is ensured if the inspection and maintenance are done every 1,000 hours of use. Table 1 shows the relation between time used and inspection period.

Table 1

Average hours used per day	When inspection is necessary		
	About 1 year	About 18 months	About 3 years
One hour	▨	▨	▨
Two hours	▨	▨	
Three hours	▨		

3. Before Determining that the VCR is Faulty

When a VCR has been used for over 1,000 hours, the symptoms shown in Table 2 may occur in the playback picture. These faults may be remedied by cleaning and lubricating mechanical components. Check the hours for which the VCR has been used referring to Table 1. If you determine that the VCR is ready for inspection and maintenance, check the inspection locations shown in Table 2.

Caution : If the VCR cannot be restored to normal operation after cleaning components marked "○" in the part replacement column, they are degraded. Replace them.

Table 2

Symptom	Cause	Inspection location	Part replacement
Color beats	Dirt on full erase (FE) head or it is degraded	Clean the surface of FE head which is in contact with tape	
Poor S/N, no color	Dirt on video heads or they are degraded	Clean video heads	○
Vertical jitter	Dirt on video heads and cylinder. Dirt in tape transport system.	Clean video heads and cylinder. Clean guide rollers and inclined guides.	
Low volume or sound distorted	Dirt on audio/control (A/C) head	Clean the surface of the A/C head which is in contact with tape	○
Tape is slack or does not run	Dirt on pressure roller	Clean pressure roller and capstan shaft	○

Inspection Locations

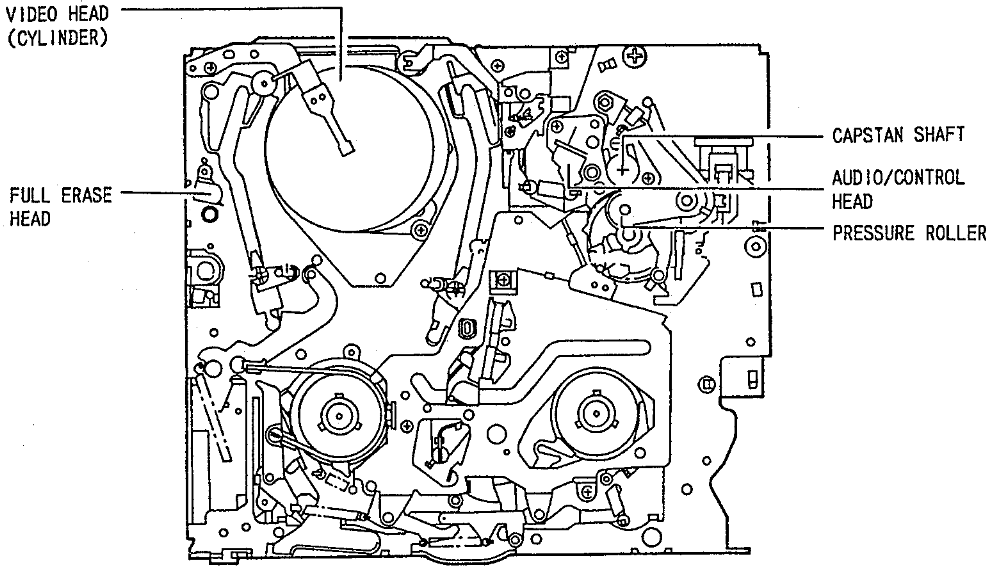


Fig. 1 Inspection Location Diagram

4. Tools Needed for Inspection and Maintenance

(1) Head cleaning kit (Fig. 2)
(2) Grease and oil for VCR (Table 3)
(3) Alcohol
(4) Gauze

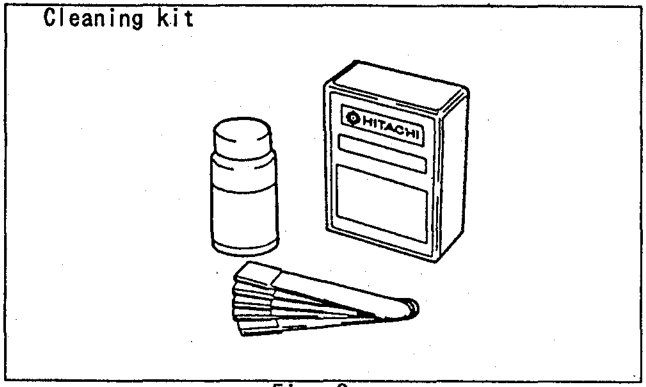


Fig. 2

Table 3 Locations for Use of Oil and Grease

Name	Lubricating or greasing location
Sonic Slidas Oil (#1600)	Lubricate low-speed rotating sections
Molicoat (PG-641)	Coat metal and mold sections under light load

5. Cleaning Procedure

(1) Cleaning video head

First use a cleaning tape. If the dirt on the heads is too stubborn to be removed by tape, use the head cleaning kit to clean the heads by the following procedure.

- Moisten the cleaning stick with cleaning fluid and touch the head tip with the stick and gently turn the head (rotating cylinder) to the left and right. (Do not move the stick vertically and be sure that only the chamois leather on the stick touches the head tips. Otherwise, the heads may be damaged.)

After cleaning, thoroughly dry the heads, then run the tape. If cleaning fluid remains on the heads, the tape may be damaged when it comes into contact with the heads.

[Cleaning method]

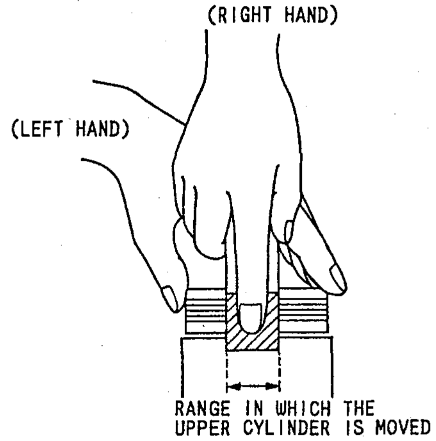
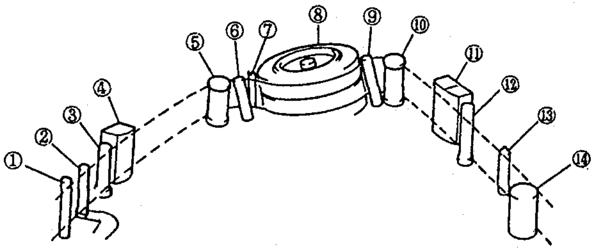


Fig. 3

(2) Cleaning tape transport system

Moisten gauze with alcohol and use it to clean components ① - ⑭ (see "cleaning video heads" for component ⑧).

Caution : When cleaning, take great care not to damage tape transport components or deform them by excessive force.



① Supply pole
② Tension pole
③ Supply guide pole
④ FE head
⑤ Guide roller
⑥ Inclined pole
⑦ Impedance roller
⑧ Cylinder
⑨ Inclined pole
⑩ Guide roller
⑪ A/C head
⑫ Take-up guide pole
⑬ Capstan shaft
⑭ Pressure roller

Fig. 4

6. Lubricating and Greasing

(1) Lubricating guidelines

Use the oiler to apply one or two drop of Sonic Slidas oil. Make sure not to use too much oil because it may spill over and leak out, coming into contact with rotating parts and causing slippage or other problems. If too much oil is applied, wipe clean using gauze moistened with alcohol.

(2) Greasing guidelines

Apply grease (Molicoat) with a stick or brush. Do not use excess grease. It may come into contact with the tape transport or drive system. Wipe off any excess and clean with gauze moistened with alcohol.

Oil or grease the specified locations referring to Table 4 on the next page.

7. Parts to be Maintained/Inspected and Maintenance/Inspection Schedules

Caution: The following table does not apply to all the units. The maintenance/inspection schedules depend on the way in which the unit is used and the environment in which it is used.

Table 4

Parts and point of Maintenance	1000h	2000h	3000h	4000h	5000h
Video Head (Upper Cylinder)	C/R	C/R	C/R	C/R	C/R
Audio/Control (A/C) Head	C	C/R	C	R	C
Full Erase (FE) Head	C	C	C	R	C
Supply Guide Roller	C	C	C/R	C	C
Take-up Guide Roller	C	C	C/R	C	C
Tension Band		R		R	
Tension Arm	C	C	C	C	C
Supply Reel Disk		C		C	
Take-up Reel Disk		C		C	
Pressure Roller Assembly	C	R	C	R	C
Drive Belt		C		C	
Capstan Motor	C	R	C	R	C
Loading Motor				R	
Cylinder Motor		R		R	
Mechanisim State Switch				(R)	
Reel Gear L		R		R	
Reel Gear R		R		R	
Reel Drive Idler		R		R	
Inclined Guide of Supply Guide Roller Base	C	C	C	C	C
Inclined Guide of Take up Guide Roller Base	C	C	C	C	C
Impedance Roller	C	C	C	C	C
Tape Guides (Guide Poles)	C	C	C	C	C
Lead of Lower Cylinder	C	C	C	C	C
Supply/Take-up Main Brake	C	C/R	C	C/R	C
Supply/Take-up Sub Brake	C	C/R	C	C/R	C
Head Cleaning Bracket					(R)
Shaft of Supply Reel Disk		S		S	
Shaft of Take-up Reel Disk		S		S	
Shaft of Reel Gear L		S		S	
Shaft of Reel Gear R		S		S	
Shaft of Center Pulley		S		S	
Shaft of Pressure Roller Assembly		M		M	
Guide Roller Base sliding part of Chassis					M
Contacting part of Cylinder Base and tip of Guide Roller Base					M
Contacting part of Tension Arm and Supply Guide Roller Base					M
Sliding part of chassis, Upper Plate and Pressure Roller Drive Arm					M

R : Part replacement
C : Cleaning
S : Oil (Sonic Slidas Oil) refilling
M : Grease (Molicoat) refilling